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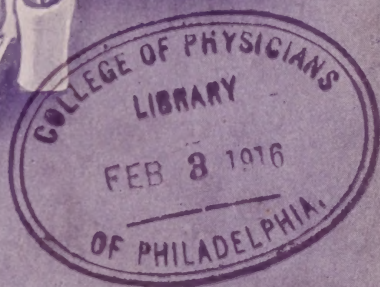
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THE JOURNAL OF
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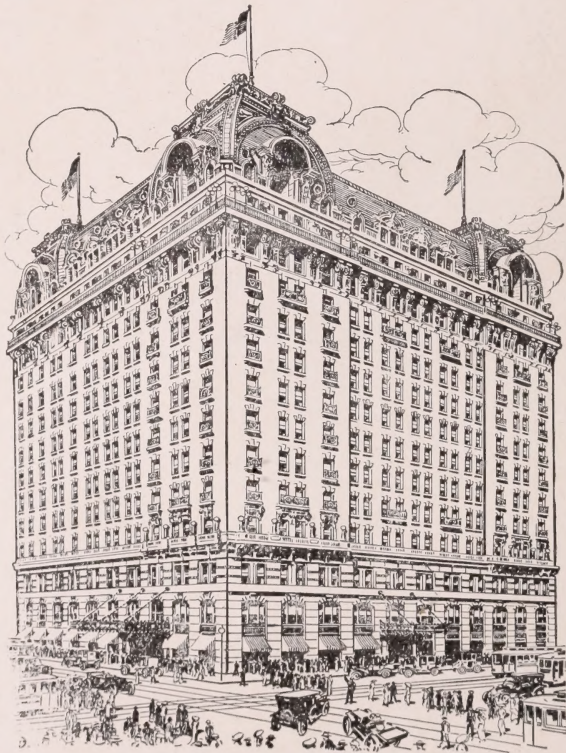
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WILLIAM H. PHILLIPS, M. D.

Cleveland, Ohio.

President 1915-1916 of the American Homœopathic Ophthalmological, Otological
and Laryngological Society.

Journal of Ophthalmology Otology and Laryngology

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Editorial

WILLIAM H. PHILLIPS, M. D.

BORN at Chagrin Falls, Ohio, April 5, 1871. Educated in the Cleveland Public Schools. Graduated from Cleveland Medical College, 1893; Chicago Eye, Ear, Nose and Throat School certificate, 1896; New York Clinics, 1897; European Clinics, 1904 and 1912.

Professor of Diseases of the Nose and Throat in the Cleveland Homœopathic Medical College, 1906 to 1910. Professor of Diseases of the Ear, 1910-1912. Professor of Ophthalmology, 1912-13 and in 1915. Otologist to Huron Road Hospital, 1906-1910. Eye, Ear, Nose and Throat Surgeon, Cleveland City Hospital, 1904-1913. Director and Eye, Ear, Nose and Throat Surgeon at Glenville Hospital at present time.

Member Cleveland Homœopathic Medical Society; The Glenville Academy of Medicine; The Ohio State Homœopathic Medical Society; American Institute of Homœopathy; Homœopathic O., O. and L. Society, and Fellow of the American College of Surgeons.

THE O., O. AND L. MEETING FOR 1916

For many years it has been the policy of the O., O. and L. Society whenever at all consistent with its own interests to select as its place of meeting the place chosen by the A. I. H. at its regular meeting in June. But in the last two or three years the trustees of the A. I. H. have come to believe that the members of the A. I. H., in body assembled, are not competent to decide where they want to meet and have taken it upon themselves to render so uncertain the place of meeting that the auxiliary societies, who require time for preparation, are very much embarrassed. This year at the meeting of the Clinical

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Congress of Surgeons in Boston this matter was put up to the twenty-five or thirty members of the O., O. and L. assembled at the Massachusetts Homœopathic Hospital, and it was unanimously agreed to disregard the Institute session and hold a two-day clinical session either in New York or Philadelphia, such session to be held either on the Friday and Saturday preceding the Institute meeting or on Monday and Tuesday of Institute week.

This session, which will be devoted entirely to clinics and special demonstrations, will be supplemented by a one or two-day session for business and papers at Baltimore, Rochester, San Francisco, Hong Kong, or whatever place the Institute trustees may finally decide to permit the A. I. H. to assemble. We believe that by following out this program the members of the O., O. and L. can receive the maximum of benefit, and none who wish to do so will be deterred from attending the Institute and its sessions. Either New York or Philadelphia can furnish us plenty of material for demonstrating any of the newer methods of operating or treatment. One evening can be given over to the consideration of some important topic or to a discussion of the operations and demonstrations of the day, and the other to a banquet.

The session at the final place of meeting will be devoted to business and to important papers and discussions. Important among these will be the report of the committee appointed early this year to prove or disprove the theory of "Macular Oscillation" of Dr. George, of Chicago. Several of our best men are working out methods calculated to prove beyond cavil the truth or falsity of the theory. One of them, presented lately by Dr. W. O. Bell, of Seattle, is one which any member of the O., O. and L. who has the opportunity should try out. An eye which is to be enucleated should be punctured along its antero-posterior axis by a needle or fine knife, transfixing as nearly as possible the center of the cornea and the macula. Then with both eyes turned as far as possible to the right an X-ray plate is made with the plate beneath the chin. Then with the eyes turned as far as possible to the left another plate is made. If now the exact middle line of the skull has been mapped out by a lead wire, if no rotation has occurred at the macula, the deep portion of the needle should in both plates be exactly the same distance from the wire marking the median line.

We wish to call your attention this year to the qualifications and

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requirements for membership as published in the November issue of the JOURNAL, page 907, and ask that in presenting names of candidates for membership these regulations be strictly adhered to. The man who has not these qualifications can add little to the dignity of the O., O. and L. and the man who is unwilling to exert himself sufficiently to meet the requirements will never add much to its strength and virility. Pick only the live, wide-awake, trained men in your vicinity; a dozen new members, active, capable and efficient are better than fifty who have nothing to give and no capacity to receive.

It is not at all unlikely that in the near future the membership of the O., O. and L. may be called upon for some sacrifice in the way of pledges for the upbuilding of a postgraduate school for the teaching of the branches comprised in our specialty. The American College of Surgeons raised over \$450,000 of an intended half-million during the past year from the membership, as an endowment fund to defray the expenses of the College in carrying out its work. It would seem as though we ought to be able to raise at least one-tenth that sum without difficulty. Fifty thousand dollars properly placed and safe-guarded, or even retained by the society as an "Educational Fund," and the income paid over yearly to such institution as in the judgment of the trustees merits its support, would go a long way towards securing efficient training for our students and raising our institutions out of the slough into which some of them seem to have fallen.

A more complete announcement of the clinical program will be made at an early date. In the meantime suggestions from the members as to just what would be most appreciated and titles for papers to be presented at the second session will be gladly welcomed by the president and secretary.

W. H. PHILLIPS.

THE POST-GRADUATE STUDENT

It is not hard to draw reasonable conclusions from the observation of the numerous men who come to the large medical centers to get in touch with those better versed in the specialties. The post-graduate student is truly a variable and interesting species, and deserves, at least for his own benefit, a careful classification. His makeup is de-

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terminated largely by the relative proportion of three qualities,—his ability, his determination and his ultimate object.

As to his ability, there appears the greatest difference in men in every walk of life. One may by nature be blessed with powers of observation, with capacity for understanding and relating, and with the ability to reason, deduct and conclude. His poor fellow-wanderer may be absolutely bereft even of "horse sense,"—may lack memory, thoughtfulness and power of concentration.

Of both these types there are two peculiar hybrids, dependent upon the factor of the interjection of education or attempts at education. The man with natural ability may have been unfortunate in the lack of opportunities for establishing a good foundation; the other man, without natural ability, has had educational opportunities which have merely satisfied *himself* as to his preparation for his future work. The former is a man to whom you can talk; a man who will ask intelligent questions; a man who wants to learn and whom it is a pleasure to teach. The latter asks no questions, is critical and unproductive.

And now look for another factor in the student,—determination to accomplish. There is one type that is content with a bookish knowledge of his chosen branch. He will stand around in the clinic, taking everything in, chatting intelligently and holding forth critically on the subject at hand. But, try as you will, you cannot get him down to the careful routine examination of a patient. Given a new case, he does not know what to look for; cannot interpret what he sees; in short, does not know how to question or examine a patient, and, worst of all, it seems that this phase of the work does not interest him.

On the other hand, take the determined student who wants both to learn and to accomplish. You will find him eager at the suggestion of examining patients and making the diagnosis for himself; studying what he sees, trying to understand the patient's condition, and not attempting to match it up with textbook description. This is the man who learns by seeing and touching, and the ground he gains is much more positive and permanent thereby.

And, lastly, the student can often be determined by the evidence of his *purpose*. There is one man who takes up a specialty as a pastime; he usually has independent means and has to fill in the time somehow. Though he is often pleasant, affable, intelligent—regular and thorough

in his work; he lacks that incentive, that *vis a tergo* that would make him a successful and brilliant man. His opposite is the fellow often less fitted by ability, education and manner to *make good*, but who has that touchstone, "push," that catches the opportunities as they come and industriously turns them to his advantage.

These types then we find, determined by (1) ability, (2) desire to learn and accomplish, and (3) purpose or direction. We find their positive and negatives usually mixed in any given man, but there can be no doubt as to what general type *we would choose* upon which to mould ourselves.

DOUGLAS MACFARLAN.

COMMENTS ON FLEXNER'S "ENGLISH SIDE OF MEDICAL EDUCATION"

In last month's number of the JOURNAL there appeared in the editorial pages an abstract of an article written by Abraham Flexner for the *Atlantic Monthly* entitled, "The English Side of Medical Education." In abstracting Flexner's article I did so freely, believing that his report was written in the interest of the medical profession as much as that of the public; besides, there are some among our readers who though interested in the subject may have missed the opportunity of securing the October number of the *Atlantic Monthly*.*

In the December JOURNAL OF O., O. AND L. Flexner was quoted liberally, in the belief that one can state his own findings better than anyone else can for him.

In commenting on Flexner's report, I agree with him in most of his findings but take issue with him in others. Concerning the English apprenticeship system, there is no doubt that it tends to make the most practical man. The value of the clinical method of teaching has been appreciated in America no less than elsewhere, and at present it would be difficult to find an American institution where this system has not been adopted. I remember the so-called sub-clinics held in Hahnemann College, of Philadelphia, as far back as 1892, where the instructor would take from the Senior class—occasionally the Junior class—six

*For those who are especially interested in Flexner's report I would suggest that they secure the original article in the *Atlantic Monthly* for October, 1915.

students, and in turn have them take a history, examine a case and finally prescribe, the instructor guiding the student when necessary.

The students looked forward to these sub-clinics with a great deal of pleasure and finished the hour with considerable satisfaction. The Germans (including the Austrians) practice this same method of teaching post-graduate classes, a fact that Flexner omitted to mention in his presentation of the German side of medical education, for the reason that he limited his subject to under-graduate teaching.

No one finds fault with this system; it has given to the world some of its greatest men in the various fields of science and art.

While the apprenticeship system has certain recognized advantages it also has its disadvantages, and not the least of these is the tendency for the apprentice to imitate his teacher, especially the dogmatic teacher. The less capable the teacher the less capable will his apprentice be when he is graduated. Furthermore, the less capable the teacher the more dogmatic he is inclined to be, and the student runs the risk of being even more narrow-minded than his teacher.

If you desire to have your son learn a trade, what do you do? You look about for an honest, capable and successful mechanic who is seeking an apprentice. You would not think of placing him in the hands of one whom you know to be dishonest, incapable and unsuccessful.

The apprenticeship system although it may produce a practical man does not necessarily produce the most capable man. The capable man is the product of an apprenticeship served under a capable teacher, and it is this difference that distinguishes the German-finished product from the American. So far as system is concerned, it is practically the same for post-graduate students in Germany, England and America.

Now wherein lies the difference in results? It cannot be in anything other than the capability of the teacher.

Is it possible that the post-graduate teacher in Germany excels the post-graduate teacher in America? The answer to this question is go sample both and decide for yourself. If lacking this opportunity, question those who have had it. The reply will be, as I have found it, unanimously in favor of the Germans. This is a humiliating confession for an American to make.

Why does the German teacher excel the American? Because in

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Germany only the best survive—due to the merit system. An American landing in Vienna to take up post-graduate study comes in contact with other American students who have been there ahead of him. In conversation with them the newcomer learns who among the instructors give the best courses. The student being free to choose his instructors naturally prefers the best as recommended by the students who have had the longest experience. He decides to arrange for courses with the best teachers, and awakes to the fact that the best teachers are in such demand that he is compelled often to look up courses several months in advance and await his turn for a place. Eventually he may sample courses given on the same subject by less popular teachers, and by comparing them he gains an experience which is of value to others who are to follow him. In the course of time only the best teachers survive and become popular, while the less capable are ignored; and I will add that I would it were so in this country for the good that would come to our institutions, the profession and the public. It allows free competition where merit wins and the decision is left, so to speak, with the fans.

Unfortunately, in America things are different. The teaching staff of the post-graduate medical school secure their positions somehow, but not necessarily on merit. The teacher is not selected by the student, but for him. There is no free play of competition among the teachers, as in Germany, and where competition is stifled there is inertia. In some of our post-graduate schools in America the instructor does not care whether he teaches or not. He is satisfied to do just enough work to keep his name on the school roster. So long as conditions remain as they have been, just so long will America lag behind Germany in the matter of post-graduate medical education. It is not the desire of the American post-graduate student that conditions continue as they have been, for it has worked a hardship on many an American student in the past, when he was compelled to go to Europe to get the best. The average young man would prefer to take this post-graduate instruction at home; nor can it be that the profession at large or the laity desire to see America lag behind Germany in the matter of education, medical or otherwise. Such a desire, to say the least, would be unpatriotic.

Concerning the correction of our poor American system, or, as Flexner puts it, "lack of system," I will not venture anything at this

time for want of space, but may do so at some future time if the invitation is urgent enough.

G. W. M.

A PLEA FOR ADEQUATE METHODS OF DIAGNOSIS

Dr. Philip Rice, of San Francisco, once more shows his originality in thought and his independence of expressing it in a leading article in the November number of the *North American Journal of Homœopathy*, under the title, "Our Inadequate Diagnostic Methods."

He begins by saying that "If one were to put into a single word the most serious fault in all our clinical endeavors, diagnostic and therapeutic, no better word could possibly be chosen than the word "Empiricism!" This truism expressed by Dr. Rice is apparent to everyone who pauses to think. Too many of us are prone to follow the beaten path, accepting from this or that author with blind credulity his version in matters of diagnosis and treatment.

The majority of us are mere apes in the profession, and it is encouraging to find Dr. Rice among that small minority who are not. This blind credulity with which the majority of the profession accept authority was never so forcefully called to my attention as it was recently, when looking up the textbooks on the subject of the ear and the special ones on the labyrinth. With a single exception, they all accepted Barany's version of spontaneous nystagmus and turning nystagmus, which any one of them could have disproved by independently making but a limited number of examinations of normal individuals. Should Professor X come out with the claim that a modified radical operation will cure 90 per cent. of all cases of chronic middle ear suppuration, and with excellent results as to hearing, the next few months will find the literature teeming with articles endorsing that particular method by those whom I have chosen to call the apes in the profession. They will even go so far as to make claims that outdo those of the original author. The damage done sometimes requires years of effort, and even greater arguments to undo. As I have said, on a previous occasion, "to him who tears down an old established falsehood is due as much credit as to him who makes a bona fida discovery." Empiricism and blind faith in authority are the greatest impediments

to scientific advancement in medicine. Volumes could be filled with the citation of instances to prove the truth of this statement.

Dr. Rice, in dealing with the subject of diagnosis, quotes the definition of diagnosis from the dictionary as, "The art or act of recognizing the presence of disease from its signs and symptoms and deciding as to its character. The art of distinguishing one disease from another." According to his judgment this definition is incomplete, for it does not take into account the full consideration of all the predisposing factors to the disease and those that determine the peculiar individual expression which the disease may present. In short, Dr. Rice claims that the dictionary definition of diagnosis is incomplete. This is another one of Dr. Rice's truisms to which we cannot take exception.

Let us consider for a moment the commonly accepted definition of chronic middle ear suppuration. By abstracting the symptoms and signs common to all cases of chronic middle ear suppuration, we understand the condition to be one in which there is a discharge of pus from the middle ear cavity through a perforation of the drum membrane, and which has lasted for a considerable (indefinite) period of time. This is an incomplete picture of any case. As I have said elsewhere, a diagnosis of a chronic middle ear suppuration must comprehend everything about the particular case under consideration. (a) Why did the patient have a middle ear suppuration in the first place? Was it due to a lowered general resistance of the patient, to an increased susceptibility to a particular pathogenic organism, to the presence of adenoids, tonsils or obstruction in the nose, or to a combination of these several factors?

(b) Why did the acute middle ear suppuration pass over into the chronic stage instead of recovering spontaneously as the average case does? Was it because the patient was neglected by the family or the physician? Was it due to the continuance of the circumstances that led to the original local infection? Was it due to complications that developed subsequently, such as cholesteatoma, necrotic bone, adhesive bands, imperfect drainage from any cause, chronic mastoiditis, etc.? Was it due to more general causes, such as lack of proper food, clothing, fresh air, overwork, etc.? Was it due to some obscure disease in some of the other organs? Was it due to some constitutional disturb-

ance that drained the patient and impaired his power of repair, such as syphilis, tuberculosis, diabetes, etc.?

(c) Furthermore, we must consider the case from another standpoint. Is the chronic middle ear suppuration complicated or not? In other words, is the suppurative process limited to the middle ear cavity or has it spread beyond the confines of the middle ear, and if so to what extent?

As I understand, a diagnosis, and as I take it Dr. Rice does, too, is not the mere tagging of a patient's disease condition—for instance, chronic middle ear suppuration—but a diagnosis which comprehends every feature in a particular case. No two cases are identical, though they may both have running ears lasting over a long period of time. Since the diagnosis determines the therapeutics and, furthermore, since no two cases are exactly alike, so, too, no two cases require exactly the same form of treatment.

G. W. M.

ANNOUNCEMENT.

Dr. Frank O. Nagle, of Philadelphia, will act as associate editor for the February number of the JOURNAL. Judging from present indications and the energy he is putting into his efforts to secure material, we feel sure we can promise our readers an excellent number for February.

PREFACE

THE first six papers of the JOURNAL are devoted to a Symposium on the Antrum. The articles were written with particular reference to practical work, without going into elementary detail. As our JOURNAL deals only with special branches of medical science, we presuppose a familiarity with the groundwork of these branches.

The Symposium is opened by Dr. Douglas Macfarlan with a paper entitled, "Notes upon and Aids to Antrum Diagnosis."

Dr. R. H. Skillern, the author of a well-known textbook on the accessory sinuses, writes upon the decision to operate in maxillary sinusitis and upon the choice of operation. Being one of the first in operative work on the sinuses in this country, and having followed closely this work from the beginning, he has had a long and valuable experience.

Dr. R. H. Ivy is well fitted to present his articles on the relation of the teeth to the antrum. For years he was associated in the University of Pennsylvania with Dr. M. H. Cryer, who did the first serious work in this country upon the anatomy of the sinuses.

Dr. G. J. Alexander's paper is of special value to those who do not realize what radical work can be done—and well done—under local anesthesia.

Dr. H. M. Goddard, whose experience with the submucous operation has been wide, reports on the relation of septal deflection to sinus disease.

Dr. G. W. Mackenzie reports an unusually interesting case of Leontiasis ossea which involves the maxillary sinuses.

DOUGLAS MACFARLAN.

NOTES UPON AND AIDS TO ANTRUM DIAGNOSIS

DOUGLAS MACFARLAN, M. D.,

Philadelphia.

THE antrum, by virtue of its situation and accessibility, is the easiest of the sinuses to examine, and the methods at hand give us a variety that should leave no possibility of failure in proper diagnosis. However, as easy as this work is there is much indifference to a finesse in the use of the means and in interpretation of what they show us.

The simplest diagnostic signs in this region are perhaps pain and tenderness, and these may be passed over with but little note, in spite of their value. The pain is a deep pain or bony soreness—a “boring” pain with a “heavy feeling” in the cheek-bone. There is in the acute attack a sharper type of pain and often apparent “exquisite tenderness,” but the latter is more frequently due to the apprehension of the patient. With the chronic antral conditions, free from active bone necrosis, pain and tenderness may be absent except during acute exacerbation. Again, occasionally one hears the patient describe, “a tense fulness that gives a severe pain;” this is the pain of pus or mucus under tension, seen so often with frontal sinus troubles.

Some suggestions as to eliciting the comparative severity of symptoms may be of help. There is value in attempts to distract the patient’s attention from palpation over the sinus. Contrary leading questions may be asked, such as, “You do not feel any pain in this cheek, do you?” Again, putting the thumb over each sinus one can use different degrees of pressure to determine exactly how the normal and diseased sides compare, and find how much pain to attribute to the patient’s imagination. It is not infrequently found that by these means one can easily be fooled if the patient’s word is taken.

Pus. And now what can be said about pus from the diseased antrum? It of course should come down over the lower turbinate out of the middle nasal fossa, usually a little farther back than that expected from the frontals. But we cannot depend alone on inspection and we call on the postural tests. The proximity of the sinus outlets

NOTES UPON AND AIDS TO ANTRUM DIAGNOSIS.

must be kept in mind and gradually the innocent sinuses must be excluded from the offending one. It is well to remember the frequency of multiple sinus involvement, and on finding pus in one sinus the postural tests should be repeated after the syringing. There is the



Postero-anterior view of J. F., gunshot wound of face. Wound of entrance left upper jaw—traversing the antrum—fragments in the orbit—sinus from the antrum to the skin below the external canthus. L. antrum infected—picture shows a probe in the sinus passing through the antrum, coming out the wound of entrance.

rare possibility of the frontals draining into the antra ; both Frazier and Cryer have found this in the cadaver, the duct either opening directly

into the antrum, or by the presence of the antral orifice in the floor of the hiatus semilunaris, pus is directed into the lower sinus.

Nor must the anterior ethmoids be free from suspicion with pus in this region, though with this condition surgical interference alone can



Trocar in the antrum—touching its posterior wall.

eliminate these cells; we have at present no other *positive* way of determining pus coming from them.

Rarely do we find complete occlusion of drainage of an empyema of this sinus, yet the muco-pus may be thick enough to remain, even in

the postural test. It is perfectly possible for the normal opening to be so small and the congestion of its mucous membrane so great that it is closed.

PUNCTURE. Puncture is simple, unusually harmless, and except for the pain to the patient there is no reason why it cannot be employed more routinely as a diagnostic aid. With the first three fingers of the left hand outlining the eminence made by the cheek-bone, one gets a fair idea of the situation of the sinus. The next most important consideration is the direction of the trochar after it has been inserted under the anterior end of the lower turbinate. On account of the importance of obtaining this direction, which may be briefly stated to be upward and outward toward the external canthus, I prefer the straight trochar. The curved instruments are apt to swing about under the pressure, and have as their only recommendation over the straight trochar the avoiding of the pushing of the cartilaginous tip of the nose over to the opposite side. The lower part of the nasal wall of the antrum is more bony and often heavier than that above, but a puncture as near the floor as possible is desirable for drainage, in spite of the little added difficulty in getting it.

In any case, it is well to guard against the depth to which the instrument is going to jump on entering the sinus. The extended forefinger and the hypothenor eminence braced against the chin—with the muscles schooled to a quick relaxation after the “dropping in” to the sinus—these will insure against the possibility of driving on through the floor of the orbit.

Another important suggestion is the advice to hold the trochar as nearly perpendicular to the antrum's nasal wall as possible. This necessitates the decided displacement of the tip of the nose. With the instrument directed obliquely the nasal mucous membrane is apt to be stripped by the tip of the trochar slipping along the nasal side of the wall.

After the sinus has been punctured it should be a routine practice to first send a syringeful of air into it before starting the washing, for it occasionally happens that even with an apparently simple puncture there has been exposure into the subcutaneous tissue of the face or into the intraorbital fat, and with air first injected the unmistakable signs of an emphysema appears. It can readily be seen that the

injected air would be of no danger as compared with an injected fluid into the tissues.

I can never forget my first experience illustrative of this point. I had punctured a chronic antrum case and had been reinserting the canula three times a week and washing the sinus—always, however, blowing air into it first. One day things went along as they had before; the canula went in nicely but the syringe of air blew out the loose cellular tissue under the eye into a soft bag that gave the typical crackling under palpation. The patient was surprised and alarmed, but was assured that nothing would come of it. I told him in particular to be careful not to blow his nose; but he must have forgotten, for that night I was called to see him and found him with his face looking like a large football. He had literally blown up his face. It is oftentimes hard to conceive how this condition arises in cases of simple puncture, but the fact that it does should make us cautious.

TRANSILLUMINATION. The use of an electric bulb placed in the mouth and projecting its light upward toward and through the sinuses has given us a valuable aid in the determination of antrum involvement. There are a number of points of utmost importance in the use of the light and in the consideration of what it shows.

(a) The light must be powerful. The tiny affair on the end of a short rod, giving poor light and burning out continually, was an abomination. There must be sufficient light for penetration. Coakley's lamp or others on this type run from the "street" current is preferable. Here there is no rheostat nor are there batteries to bother you.

(b) The examining room must be absolutely dark.

(c) The light thrown out through the cheeks must be cut down by covering this area with a folded towel or with the hand. No more light than possible is to detract from the light in the heavier sinuses.

(d) A heavy piece of tubing over the lamp—an oval window cut in the top—will both insulate against heat and will cut down the lateral light.

(e) The lips must be tightly closed around the base of the light.

(f) The examiner should stand in front of and above the patient, who is seated on a low stool. The patient's eyes should be widely-opened, looking up at the examiner.

NOTES UPON AND AIDS TO ANTRUM DIAGNOSIS.

(g) A comparison of the two sides is essential and most important in drawing conclusions.

(h) Do not expect the pupils to light up in all cases. The negroes, with heavy skulls, seldom show this. Look rather for the light arc



Lateral view of the antrum—notice its exact rectangular shape. Sella, sphenoids, frontals and the hyoid bone plain.

under the lower lid. The antra themselves should be somewhat light, but there can be no standard set, as individuals differ.

(i) Remember, shadows from old antrum troubles persist.

The X-ray has been the latest aid to antrum diagnosis and is of particular importance in the study of the relation of the antrum to the teeth. Dr. Ivy's article in this issue so well covers this latter subject that little more can be asked. However, there are points in the general X-ray appearance of the antrum that are well worth remembering.



Postero-anterior view of the skull to illustrate the passage of the rays in transillumination. Notice the triangular shape of the antrum as viewed in this position. Position of the pupil drawn in.

The two positions of taking the plates are, (1) lateral and, (2) postero-anterior. The accompanying reproductions will show how the outline of the sinus differs in these plates. With lateral exposure the antrum appears as a perfect oblong, resting horizontally on its longest side. The postero-anterior picture gives an outline of a nearly equilateral triangle, the perpendicular nasal wall forming one side. In the lateral plates the two sinuses are superimposed; the obliquity of the posture of the head can be determined by observing the angles of the jaw. The postero-anterior pictures alone can give you an idea of the floor of the antrum in its relation to the floor of the nose. Both are usually on the same level.

Here, again, a comparison of the two sides is essential, and the shadows of old antrum involvement persist.

NOTES UPON AND AIDS TO ANTRUM DIAGNOSIS.

Except for, (1) outlining the size and shape of the sinus, (2) in determining the position of the antrum floor, (3) in determining the relations of the teeth to the floor, and (4) in establishing involvement of other sinuses—other diagnostic means are much handier and simpler than the X-ray.

Before we leave the subject of diagnostic aids we must not forget the probe, which can tell us of the presence of denuded bone, thickened mucosa and polyps.

And one more diagnostic aid—the naso-pharyngoscope inserted into the antrum through an enlarged puncture. Unfortunately the instrument is comparatively so large that the anterior end of the turbinate has to be sacrificed. It is also doubtful if this method can add much to what may be previously found by the use of all the others.

The subject, then, is a little larger than one would at first suppose. We have many means—a number of instruments comparatively easy to use; and we may know, or will find out, that there is much “knack” in their use and much discrimination to be shown in drawing conclusions.

I want to thank Dr. W. C. Barker for the excellent X-ray pictures he has taken for me.

1805 Chestnut Street.

A Query Regarding Acute Antrum Infections.—There have been a number of acute antrum cases that have shown a remarkably rapid relief from local blood-letting by an incision along the free edge of the lower turbinate. The analogy can be drawn with the same relief often seen with this treatment in the common “earache.” The writer is anxious to know whether others have had as fortunate an experience.—
D. M.

WHEN SHALL WE OPERATE IN CHRONIC MAXILLARY SINUSITIS AND WHAT FORM OF OPERATION SHALL WE CHOOSE?

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WHEN a patient presents himself and a positive diagnosis of chronic purulent maxillary sinusitis is made, it is oftentimes a serious problem to determine the appropriate procedure to be adopted in order to rid him of his complaint in the shortest time, with the least inconvenience to himself. It is obviously bad judgment to immediately subject him to a more or less painful operation when persevering conservative treatment will bring about a cure; while, on the other hand, it is a waste of the surgeon's time and the patient's money to persist in a long, tedious, conservative form of treatment, when after a few days it is perfectly evident that some form of radical operation is indicated. In order properly to solve the first problem (when to operate) many factors must be taken into consideration.

I. THE GENERAL CONDITION OF THE PATIENT.

If the patient is severely affected, unable to follow his usual occupation; suffering from continuous or intermittent pain; head suffused and congested; sleep badly disturbed; profuse, purulent discharge from nose and posteriorly into throat (sudden suppression and stagnation of secretion is even worse); intermittent fever and generally miserable—immediate evacuation by means of the needle puncture should be accomplished, with strict rest in bed, the application of ice bags to the affected side of the face and forehead, in conjunction with a brisk calomel and soda purge. This treatment under such circumstances would suggest itself, for it at once gives the patient the benefit of the doubt—as it in all probability will bring about an amelioration of the symptoms and, at the same time, put the patient in a better condition should an operation subsequently be demanded. This can be accomplished the following day or the following week, as necessity dictates.

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2. THE HISTORY OF THE DISEASE.

If a patient states that he has been troubled for several years with his nose, but only lately has the discharge been profuse and the headaches severe and persistent, we can be reasonably certain that it has slowly assumed a chronic form and in all probability will be resistant to ordinary treatment. Here, however, all things being considered, an operation in the very near future is clearly not indicated. The needle puncture with lavage should be instituted and continued daily as long as the patient shows any signs of improvement. This will manifest itself in the character and appearance of the secretion. If it begins to show changes in its character, becomes less fetid, loses its crumbly, milky appearance, becomes thicker and not mixed so intimately with the irrigating fluid, as well as diminished in quantity, the conservative treatment should be persevered in. It not infrequently occurs, however, that under this form of treatment the disease becomes checked and reaches a certain stage when the patient is relatively comfortable, the discharge being at a minimum and the headaches controlled; yet if the time between the treatments is lengthened, an immediate exacerbation of the symptoms occurs. In these cases other drugs should be applied to the mucosa of the sinus in addition to the normal saline solution of the irrigating liquid. Nature must be further assisted than is possible with mere evacuation of the purulent secretion and cleanliness accomplished by the lavage. The lining mucous membrane of the sinus is evidently in such a diseased condition that it cannot throw off the infection with these means, but requires asepsis and stimulation. This can be accomplished with either alcohol or a solution of nitrate of silver in varying strengths: After the normal saline solution has been expelled from the sinus, by causing the patient to bend the head toward the sound side and forcibly injecting air through the needle until no more liquid appears, the syringe is partially filled (about two ounces) with 50 per cent. alcohol and the sinus slowly filled, the head being held in the upright position until the alcohol begins to trickle out of the nose. The needle is then withdrawn, leaving the alcohol in the sinus. This should be repeated after every irrigation until full strength alcohol is used. If the disease continues to resist this form of treatment a solution of nitrate of silver may be substituted for the

alcohol. The initial strength can be gr. 30 to the ounce, gradually increasing until a 25 per cent. solution (120 grains to the ounce) is applied. If this fails to bring about a marked improvement in a very short time (five irrigations) some form of radical operation must be considered.

At this point let us for a moment consider the advisability of using a heavier and more forcible stream of liquid than is possible with the ordinary exploring needle. It is of course impossible to throw a stream with much cleansing strength through an instrument with such a small lumen as the needle. On this account it has been argued that the Krause trochar and canula is much better fitted for this work, and possesses decided advantages over the needle because of the comparatively heavy stream made possible by its use. It has been my experience that where the needle has failed the trochar has also been unavailing; therefore, why should one submit the patient to the pain always incident to the passage of this instrument when the needle puncture can be repeated with little or no discomfort.

Recurrent attacks. If on questioning it is evident that the disease is of long standing, acute exacerbations being frequent and one present at the inception of the present treatment, the indication for a radical operation lies largely with the patient himself. He knows that conservative treatment will probably bring about an amelioration of the symptoms, as it has done many times previously; at the same time he is cognizant of the fact that a cure will not be obtained, although perhaps hoping that this may actually be his last attack. There the surgeon's duty is clear. He can either institute the conservative treatment, promising the patient little in the hope of an ultimate cure, or advise a radical operation at once; citing otherwise a continuation of the attacks in increasing severity until the operation is urgent; running at the same time a certain risk of orbital and even cerebral complications, when it will be too late for surgical interference to be of avail. The responsibility in any event is placed entirely with the patient.

There is one history which, when present, demands an immediate operation, *i. e.*, maxillary sinusitis of dental origin. Antral suppuration resulting from the teeth occurs in approximately 20 per cent. of all cases. It is always extremely chronic, being in fact chronic from its inception. The pathological process being an extremely slow one

causes a low grade form of inflammation along the floor of the sinus, in the alveolar fossa. Even should the offending root previously have been removed, the disease remains, showing but little tendency toward a spontaneous cure unless good drainage has been established. Suppose, however, nothing had been done and certain symptoms pointed toward dental involvement; one or two of the upper (premolar to wisdom) teeth were sensitive to heat and cold or percussion with a metal instrument, or felt longer than their immediate fellows. An X-ray film should immediately be taken to determine precisely the particular roots affected, as well as the extent of the disease. This is particularly important as it must not be forgotten that idiopathic antral disease may secondarily affect the teeth roots, especially if little or no cancellated bone-tissue lies between their apices and the floor of the antrum. In this way it is often possible to prevent a slightly diseased tooth which is amenable to treatment from being needlessly sacrificed. If, on the other hand, the film showed us that the root was primarily affected, the corresponding tooth must immediately be extracted and the root canal sufficiently enlarged with a suitable borer to enable one to irrigate the sinus thoroughly and keep the opening patulous with a well-fitting prothese made by a dentist. Daily irrigation through this opening in the alveolus will bring about a cure in almost every case of antritis of dental origin, provided, of course, that permanent pathological changes have not taken place in the mucosa of the sinus. The same form of treatment should be instituted in those forms of maxillary sinusitis coupled with manifest caries in a tooth where it is possible to connect the two directly by passing a fine sound through the carious portion of the tooth directly into the sinus cavity. The antiquated treatment of attempting to favor continuous drainage by the installment of a tube in the opening is as uncleanly as it is insufficient, and should be abandoned.

3. THE PROBABLE PATHOLOGICAL CONDITION OF THE SINUS MUCOSA AND THE OSSEOUS WALLS.

When this can even approximately be determined our indications are much clearer than is otherwise the case. If permanent pathological changes in the form of polyps or polypoid hypertrophies are present in the antrum, we can irrigate until doomsday with no appreciable effect

on the condition. The condition of the mucosa can be judged in several ways. (a) By the consistency of the secretion. If it remains granular, sinking to the bottom of the pus basin, mixing with the irrigating fluid or continuing fetid, we can be assured that such changes have taken place in the mucosa as to preclude the possibility of a cure by the irrigating route. (b) If the irrigating liquid seems to meet with continual resistance at every attempt at lavage, it is probable that the mucosa is so swollen that the point of the needle becomes therein imbedded. (c) When the X-ray shows little diminution in the shadow immediately after lavage, it is caused by the swollen mucosa or polypoid hypertrophies. If either or all of these signs and symptoms are present, some form of radical operation which will enable one to thoroughly rid the cavity of these pathological products is unquestionably called for. If the bony walls underlying the mucosa show signs of involvement from the diseased mucosa, immediately an indication for prompt operative interference is given. This manifests itself by tenderness and in some cases edematous swelling over the antrum. The pain is particularly marked at night. The character of the discharge furnishes a cue, and osseous disease should be suspected when it remains fetid and crumbling despite frequent irrigations followed by nitrate of silver injections.

4. OCCUPATION, SOCIAL CONDITION, AGE AND SEX. GENERAL CONDITION OF PATIENT.

The possession of a chronic purulent maxillary sinusitis is of far greater import to individuals following certain occupations than to others in different lines of work. Thus a school-teacher, a barber, a hotel clerk or others in similar employment, who constantly come into more or less personal contact with a large number of people, find it very much to their disadvantage to be continually hawking, expectorating and blowing their noses; while masons, drivers, plumbers and outside workers in general can carry a diseased antrum around with very much less discomfort. In these separate occupations it is much more than a personal question as to whether they shall be quickly rid of their ailment or continue treatment for an indefinite period. In the former a disease of this character may mean the loss of their position, while in the latter this phase hardly enters into consideration.

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It is always wise, therefore, in considering the advisability of operating, to first bear in mind the particular calling of the individual.

The social condition of the patient very often gives a decided indication as to the present lines of treatment. It is obvious that they who have plenty of time and means at their disposal will prove much more favorable subjects for conservative treatment than those whose time and money are limited. The former are, as a rule, not only willing to present themselves at frequent intervals for treatment and carry out home instructions, but are anxious to avoid any form of operation as long as they are made fairly comfortable. With the latter this is not always feasible. In the first place, they cannot always present themselves at certain times nor can they always give themselves the proper attention; therefore, the opportunity for a quick, permanent cure through operative interference offers them a much brighter outlook, even though it entails the loss of a few days' time. Young people who are to be married in the immediate future must be rid of their complaint at the earliest possible moment; therefore, an operation is imperative.

Age is an important factor which must not be overlooked. Any form of a purulent maxillary sinusitis in the very young (6 months to 12 years) which shows a tendency to become chronic should cause immediate surgical intervention. In these tender ages the bones of the face are very soft and are particularly prone to inflammation (ostitis, osteo-myelitis and peri-ostitis). When the osseous structure once becomes thoroughly infected the task of a complete cure is usually hopeless. Another factor is that the sinuses themselves are very small and the operation is usually not very extensive. Some authorities consider all purulent maxillary sinusitis in children a true osteo-myelitis. Generally speaking, this is true if the disease has progressed any length of time, but it is also true that the mucosa of the sinus was probably the primary structure affected and the infection had spread by contiguity to the surrounding osseous structures. Scarlet fever furnishes an exception in that the bone appears to be affected simultaneously with the mucosa and runs a most intractable course, being often resistant even to the most radical measures.

In young adults the general system is usually vigorous and will respond quicker to conservative means than in older persons. Simple

daily lavage in the former, coupled with appropriate vaccines, will often accomplish in a week what would require months to procure in those of riper age; therefore, it is wise to exercise patience with these cases and remember that a cure has been accomplished only after a considerable number of treatments (in one case 59 irrigations). On the other hand we must bear in mind, particularly in girls and young women, the possibility of the disease making such headway that even after a radical operation the cure is not complete. It is indeed a great handicap for a woman to be obliged to carry a chronic catarrh to her dying day, even though it incommode only to the extent of the necessity of an excessive number of handkerchiefs.

In the adult, complications in the form of other diseases in conjunction with the sinusitis are not infrequently encountered, and must receive due consideration. Thus, in a case of chronic Bright's disease, or other conditions where a general anæsthesia or even a surgical shock is contra-indicated, any form of radical operation should be approached cautiously. In these cases it is well carefully to weigh the subjective symptoms and the drain of the disease on the system, with the probable immediate deleterious effects of the proposed operation. Local anæsthesia may be an important factor in determining this question.

In the very aged any form of sinusitis is somewhat of a rarity. This is probably due to the continued reabsorption of the bone, causing the antra to become excessively large and the roominess of the nostrils permitting better aeration. When a maxillary sinusitis, however, becomes established, it is a question whether they should be subjected to the shock of an operation or whether simple expectant treatment is advisable. It would seem that even in bad cases, where in a younger individual no hesitation in operating would be made, simple drainage at the most is as radical a procedure as advisable. These patients rarely suffer much pain and can get along quite comfortably with more or less of a catarrhal discharge from the nose. Occasional treatment at home will go far towards minimizing this condition.

Sex. A young woman with an occupation is in a far dissimilar position to a young man following even a similar calling. A governess or nurse with a chronic discharge from the nose would be an object of disgust and suspicion to the rest of the family, while in a tutor

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or coachman it would not be so conspicuous, as men are supposed to be subject to more or less catarrh from smoking, etc. The female members of a household seem to be particularly impressed with chronic colds or coughs which afflict any of the individuals who are continually in contact with the children. The fact that they are obliged to visit the doctor regularly contributes not a little to this dissatisfaction. These facts should be carefully considered when dealing with such cases, as few employers object to an operation with apparent cure, while many would not consider keeping an employe around the house who was afflicted with a chronic discharge.

General Condition of Patient. This may play a very important role in deciding the advisability of an operation. If the patient shows much anxiety over his condition, being nervous and depressed, bordering on periods of melancholia, it is wise to consider means for a rapid cure rather than subject him to a prolonged course of treatment, even though the latter gives encouraging signs for an ultimate recovery. The delay may be worse for the patient than the suffering which the operation curtails. I shall never forget the patient of Hajek who was so impressed by the pus that was washed out of her antrum on the first irrigation that she threw herself into the Danube and was drowned.

5. RETENTION, THREATENED ORBITAL OR CEREBRAL COMPLICATIONS.

In symptoms of retention with congestion of face, excessive pain, little discharge and fever despite daily irrigations—some form of operation is clearly indicated. Here we are practically certain that there is little hope of an amelioration until drainage and aeration is established, and delay may only cause further complications. Threatened extension to the orbit makes an immediate operation imperative, as these cases once established cause permanent changes in the eye which will follow the individual to the end of his days. Cerebral complications from the antrum have been singularly fatal; therefore, it is wise to anticipate such an eventuality, and at the slightest suspicion of the appearance of symptoms err, if necessary, on the safe side by an early and radical external operation.

What form of operation shall we chose? This will depend upon many exigencies.

1. The etiology of the disease.
2. The chronicity of the disease.

3. The tendency and course of the disease.
4. The age of the patient.
5. The social condition of the patient.
6. The physical condition of the patient.

1. The origin of the disease may furnish decided indications for a certain form of operation. If it is of dental origin the diseased tooth and root must be sacrificed, and it is better to enlarge the bony canal into which the root is inserted in order to remove the diseased bone tissue which had been directly around the apex of the root. This procedure is known as the old Cowper method and the technique is simple. After the tooth is drawn, a pledget of cotton saturated with a 20 per cent. solution of cocain in adrenalin is inserted into the cavity and allowed to remain fifteen minutes. After that time a suitable reamer is used to enlarge the canal and penetrate into the antrum. The opening is kept patulous by means of a suitable appliance (plug), and daily irrigations practiced. If the tooth is merely drawn and treatment continued with needle-puncture lavage, one runs the risk of continued infection from the diseased bone in the floor of the sinus. That form of operation which consists in the extraction of several teeth and the installation of a large hole into the antrum, although still practiced by some general surgeons, should be abandoned, as it is as unscientific as it is barbarous.

2. The chronicity of the disease. The time given for a sinusitis to become chronic is about four weeks. As a matter of fact, this depends largely upon the virulence of the infection or the peculiar susceptibility of the individual. In certain cases the disease may continue for many weeks and remain to all intents and purposes subacute, *i. e.*, but slight pathological changes have resulted in the mucosa; while in others, a few weeks' duration is sufficient to cause changes which are only met with in the most chronic forms. The extent of these changes is in direct ratio to the required extent of the operation. The greater the changes the greater or more radical the operation. If a large area of the antral mucosa has undergone polypoid degeneration, it can hardly be expected that complete drainage alone will bring about a cure. Before this can be accomplished it will be necessary to thoroughly remove the diseased tissue by means of the curette, in order that the remainder can regenerate and eventually cover the defective por-

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tions. An incision through the canine fossa, so that the parts can be brought under immediate inspection, will be the only means to this end. Whether the Caldwell-Luc or the Denker method is chosen will depend upon the fancy of the operator. Both are equally effective. The latter is perhaps the easier and the more extensive but does not give any better results than the former—at least in my hands. There is, however, a slight choice between the two under certain circumstances which will subsequently be considered.

3. The tendency and course of the disease. Let us suppose that we had followed out a course of conservative irrigations in a male adult until we were convinced that an operation was necessary to effect a cure. What form shall we choose? If under our irrigations the disease would abate only to continue in its old course after the treatments were suspended, we can take it for granted that something a little more pronounced in the aeration and drainage will bring about the desired result; obviously, a radical operation is not necessary, yet something more than mere cleansing irrigations must be applied. Here the preturbinal method has its greatest indication. It can be done under focal anæsthesia; little tissue is sacrificed; the sinus can be fairly well inspected, particularly by the naso-pharyngoscope; topical applications can be made; thorough drainage installed, and the patient hardly incapacitated. The various operations under the inferior turbinate would probably answer in this case, but as they entail sacrifice of more or less turbinal tissue they are now practically discarded. If it were subsequently found necessary to reoperate (this has never occurred after the pre-turbinal in our hands) a considerable portion of the radical operation has already been done, and it will only be necessary to resect a portion of the canine fossa wall and curette, the nasal opening having already been made.

4. The age of the patient. Fortunately infants and very young children are seldom afflicted with purulent sinusitis, due mainly to the absence of partial development of the true sinuses. It must be remembered that in a child one year old no frontal or sphenoidal exists, while the maxillary is about the size of a bean; the ethmoid labyrinth, however, though small is fully developed. As ethmoiditis far outshadows other sinusitis in children the problem confronts us as to the form of operation indicated. Unless complications (orbital or external rupture)

threaten or have supervened, the conservative or intranasal method is on the whole better, as the cells can be fairly well exenterated with good hope for ultimate recovery. Under a general anæsthetic and a good light a small curette is introduced beneath the middle turbinate, and all cells from the sphenoid anteriorly broken down and removed. After this procedure one finds that the indications for an external operation rapidly diminish, particularly if the patient happens to be a little girl.

Maxillary sinusitis in the young will more frequently require energetic measures, on account of the extreme softness of the surrounding bony structures and their well-known tendency towards osteomyelitis. If the nostrils are very small, making intranasal work both difficult and uncertain, it is better to perform at once a modified Denker with thorough curettage of the entire antral cavity. The result will often be a rapid and complete case, where temporizing with conservative measures will allow the disease to become thoroughly imbedded in the bone with no ultimate hope of a permanent cure.

Frontal and sphenoid sinusitis, *per se*, never exist in children, as far as our experience teaches.

In the old, extensive radical operations are usually not indicated. As a rule, a recent case of sinusitis in a patient advanced in years is not very severe, due probably to the excessive size of the drainage passages. Should it demand something more than conservative treatment an intranasal operation is usually all that is required. It is not well to subject one of these patients to an extensive operation, not only on account of the general surgical shock but to the enfeebled recuperative powers of the parts themselves. The sensibilities of these old folk are benumbed and the installation of an opening sufficient for drainage is usually more acceptable to them than the trouble incident to continued treatment or the discomfort, not to say uncertainty, of a radical operation.

5. The social condition of the patient. A great deal less can be done in the way of a radical operation on a young lady of some social standing than, for example, on a maid or waitress—for two reasons. In the first place, in the former, if the disease has become chronic it is usually of recent date, as immediate attention was probably given it; and secondly, she will have more time to devote to sub-

sequent treatment. Most of the female members of the better class prefer far to undergo some form of conservative operation (when an operation is indicated) than to resort to anything radical, even though the after-treatment must necessarily be continued over some length of time. I know of nothing which meets these requirements so thoroughly as the pre-turbinal operation. Here a conservative operation gives semi-radical results, and at the same time is of little immediate inconvenience to the patient; no great swelling of the cheek, wound in the mouth or enforced stay in a hospital. For the working class, generally speaking, a Caldwell-Luc or Denker is advisable. These patients can nearly always get off for a few days for hospital purposes, and after the operation little attention is required, as the ultimate cure is but slightly influenced by treatments.

6. The physical condition of the patient. Chronic invalids suffering with serious internal disorders (kidney, heart and liver diseases) sometimes acquire antral trouble of operative importance, and a serious question arises as to the procedure to be adopted. It may be that a general shock would be dangerous, and even the discomfort resulting from an anæsthesia and hyperæsthesia of the teeth, swelling of the cheek and a wound in the mouth must be looked upon with some degree of apprehension. Under these circumstances, we always have a sheet anchor in local anæsthesia. When the anæsthetic (novacaine 2 per cent.) is properly injected it is astonishing how little pain is experienced, even when the bone is being removed. The preturbinal method, for example, is a totally different proposition under local anæsthesia than under general. The patient does not look upon it with the same degree of apprehension and the post-operative symptoms do not appear to be so marked. This is probably due to the less extensive degree of traumatism and the greater gentleness exercised with the patient in a state of consciousness. The more radical forms of the Caldwell-Luc and Denker can also be used under local anæsthesia with comfort to the patient. I recall cases in individuals with pulmonary tuberculosis operated upon under this form of anæsthesia with perfect results and no subsequent flaring up of the tubercular process.

RELATION OF THE TEETH TO THE MAXILLARY SINUS

ROBERT H. IVY, M. D., D. D. S.,

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FORMERLY the importance of the teeth in the causation of antral infection was considerably overestimated, some writers ascribing the greater number of these cases to a dental origin. The studies of Cryer, Stroebel, and others, have shown a much smaller percentage of these infections to arise from the teeth than from other sources. Cryer estimates that perhaps one-third of the cases of antral infection come from dental sources, and he is also of the opinion that there are more cases in which the teeth become secondarily involved from antral disease than cases of maxillary sinusitis in which the teeth are the primary seat of infection. The dentist has been too prone to cling to the older view, while the rhinologist tends perhaps to underestimate the importance of the teeth in this connection, and often-times to overlook them entirely in his treatment of a case. Even though diseased teeth rarely played an etiological role in maxillary sinusitis, the mere possibility would be of sufficient importance to call for a painstaking dental examination, both clinically and Roentgenologically, in all cases of sinus infection, for the disregard of such a relationship where it exists will surely lead to failure in treatment. Even in cases purely of nasal origin, the associated presence of secondarily or independently diseased teeth, lying in intimate relation with the floor of the antrum, is frequently sufficient to delay or prevent recovery even though proper intranasal drainage has been secured. Frequently, from clinical signs and subjective symptoms alone, the teeth will appear to be perfectly healthy, yet the X-ray will reveal entirely unsuspected apical areas of infection which may be essential factors in the case. Experience has shown that these foci of apical disease occur practically always in connection with teeth whose pulps have lost their vitality, either through accident, dental caries, or artificial devitalization by the dentist, and may be present in the absence of symptoms. For this reason, in any case of maxillary sinu-

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sitis where devitalized canine, premolar, or molar teeth are evident or suspected upon the side of the maxilla involved, an X-ray examination should be made. To show the detail of the relation of the root apices to the floor of the antrum, as well as the foci of dental disease, intra-oral X-ray films are most suitable. Plates frequently lack the necessary detail, and confusing shadows of other parts of the head

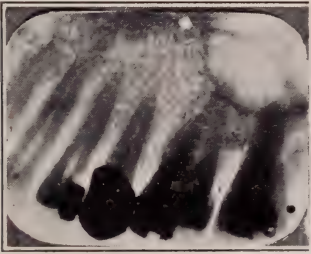


Fig. 1



Fig. 2

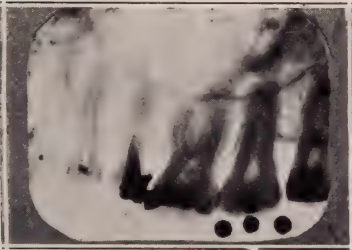


Fig. 3

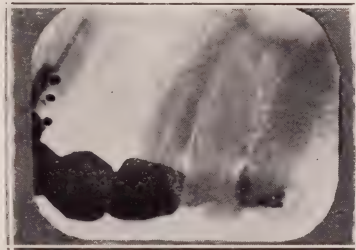


Fig. 4

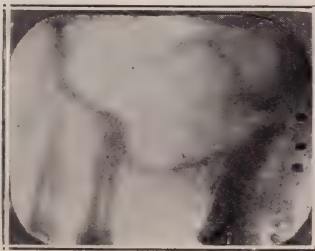


Fig. 5

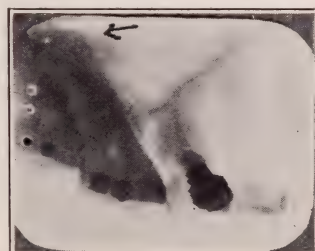


Fig. 6

FIGS. 1-2-3.—Showing relationship of roots of teeth to floor of maxillary sinus commonly found. FIG. 4.—Apex of canine root very close to floor of sinus. FIG. 5.—Illustrating thinness of bony partition separating antrum from roots of teeth. FIG. 6.—Diseased root of 1st molar had caused perforation of maxillary sinus, but no evidence of infection.

may appear. X-ray plates of course are invaluable in the diagnosis of antrum disease, affording as they do a comparison of the two sides of the head, etc., but for a study of the relationship of individual teeth

to the floor of the sinus, films are to be preferred. Occasionally a combination of film and plate will aid the interpretation still further.

The tooth most intimately connected with the floor of the maxillary sinus in the majority of cases is the first molar. Then follow in order of frequency the second molar, the second premolar, the third molar, the first premolar, and finally the canine. No general rule however can be laid down to apply to individual cases. Sometimes these



FIG. 7.—Cloudiness of left antrum due to infection from molar tooth shown in Fig. 8.

teeth are all separated from the antrum by considerable thickness of bone, especially in the negro, while at other times the bony floor is of the thinness of paper. Figs. 1, 2, and 3 are examples of the relationship commonly found. Fig. 4 shows the root apex of the canine very close to the floor of the antrum. Fig. 5 illustrates the thinness of the partition that may separate the tooth from the antrum. In fact it is difficult at times to appreciate from the X-ray film that these apices are

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not actually in the cavity of the sinus. Only by the most careful scrutiny is it possible to see the shadow of the thin bony partition. Occasionally, after extraction of a tooth, I have been able to pass a probe through the end of the root-socket directly into the maxillary sinus, apparently without rupturing any bone or mucous membrane,

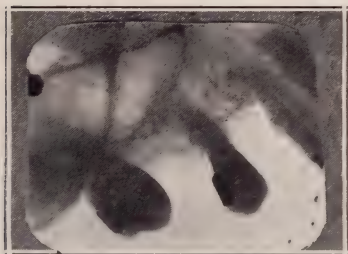


Fig. 8

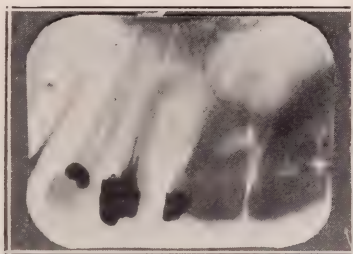


Fig. 9

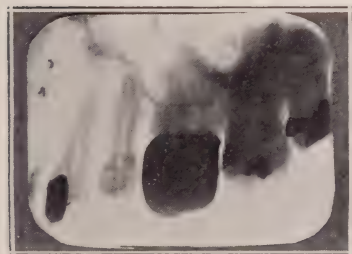


Fig. 10

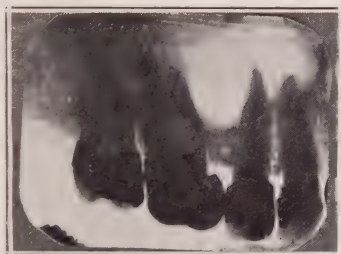


Fig. 11

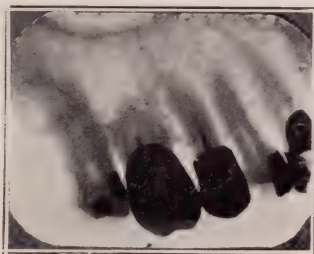


Fig. 12

FIG. 8.—Diseased root of second molar had caused perforation and infection of maxillary sinus. FIGS. 9-10.—Thin line or dense bone indicating floor of maxillary sinus. Roots of molar teeth in wall of sinus, and not in the cavity itself.

FIG. 11.—Dental cyst, connected with root of Second premolar, which projects into it. Note thin covering of bone over apex of first premolar, which was not involved. FIG. 12.—Abscess cavity involving roots of first molar. Note dense line of floor of antrum above this.

and this, too, in cases where there were no signs that infection of the antrum had taken place. I believe apical dental disease causes absorp-

tion of the floor of the antrum more frequently than is generally appreciated, without however causing extensive infection of the sinus. Fig. 6 is taken from such a case, in which there was a perforation through a root-socket of the first molar. On the other hand, there are many cases giving symptoms and X-ray signs of antrum infection due to dental disease, in which the antrum is equally accessible through the alveolar socket of an infected tooth after enlarging the opening through the socket, thus permitting drainage and flushing out via the



FIG. 13.—Cyst cavity injected with bismuth paste.

ostium maxillare. Fig. 7 is from a case of left maxillary sinus infection, in which a diseased second molar root (Fig. 8) had caused a perforation of the floor of the antrum.

Care must be taken of course to differentiate these cases from those due to primary disease of other sinuses in which the antrum is merely acting as a reservoir for pus, and which require treatment directed to the primary site of the trouble.

It is at times difficult to distinguish in the X-ray film between the

RELATION OF THE TEETH TO THE MAXILLARY SINUS.

antrum and some pathological condition, such as a dental cyst or an apical abscess cavity. The floor of the antrum may extend down between the roots of teeth, the latter apparently projecting through it, when in reality they lie in the wall, separated from the cavity by a thin partition of bone, which careful examination of the film will reveal. The floor of the antrum nearly always shows as a dense line, more marked than the neighboring cancellated bone.

In the case of dental cysts and apical abscesses, the edge of the bone is no denser than the remainder, and the apices of the diseased



FIG. 14.—Root of molar tooth forced into antrum during attempt at extraction. roots project directly into them in the film. (Figs. 11 and 12.) Occasionally, when any doubt exists as to whether the space shown is the maxillary sinus or a cyst, a picture of the opposite side will show a similar anatomical arrangement, which would be very unusual in the case of a pathological cavity. Another means of differentiation between the maxillary sinus and a pathological cavity, or to determine whether the antrum is involved in the disease present, is by the injection of bismuth paste and subsequent Roentgen ray examination.

Such a case is shown in Fig. 13, where an infected dental cyst with discharging sinus connected with the second molar was differentiated by this means from antrum empyema. For this purpose collargol might be advantageously substituted for the bismuth, being more easily removed.

In the extraction of diseased roots of teeth in close proximity to the floor of the antrum, the possibility of forcing a root up into the cavity must always be borne in mind. Fig. 14 shows a condition of this kind, where a dentist had removed without difficulty the two buccal roots of the first molar, but being unable to find the palatal root, had an X-ray examination made, with the result shown in the illustration. To remove such lost roots usually requires considerable enlargement of the opening into the antrum through the alveolar process and exploration under ether anæsthesia. If allowed to remain the root will probably keep up an intractable suppuration.

In conclusion we would emphasize the following points:

1. The possibility of infection from a dental source should never be ignored in a case of maxillary sinus disease.
2. The tooth roots in direct relation with the floor of the antrum of Highmore may be affected with apical disease in the absence of all ordinary symptoms and signs, the disease being only demonstrable by the X-ray.
3. The antrum is more frequently opened during the extraction of certain teeth than is generally supposed, there being a local absorption of the floor by the dental disease.
4. Considerable difficulty is sometimes experienced in differentiating the X-ray shadow of the maxillary sinus from the outlines of pathological cavities such as cysts and abscesses.

Thanks are due to my associate, Dr. E. J. Eisen, for the roentgenograms.

RADICAL OPERATION OF THE MAXILLARY SINUS UNDER LOCAL ANAESTHESIA WITH REPORT OF TWO INTERESTING CASES

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Philadelphia.

SURPRISE is frequently expressed by rhinologists who have not previously seen it, that an operation of such major character as the Radical operation of the Maxillary Sinus can be performed with so little discomfort to the patient and to such distinct advantage under local anæsthesia. This is probably due to the fact that it is practiced more in Europe and is rather the exception in this country. There are, however, a number of distinct advantages in its use; for instance,

(1) In such conditions as serious heart lesions, pulmonary tuberculosis, kidney lesions, etc., its administration is imperative.

(2) A number of patients, on the other hand, have an insurmountable dread of a general anæsthesia and gladly accept the opportunity to have operative conditions corrected under local anæsthesia that might otherwise go on to a serious termination.

(3) The number of days in bed and confinement to the hospital, a week or ten days that is usual with general anæsthesia or hospital cases, is in many instances inconvenient to the business man or the wage-earner, to say nothing of the antipathy others have to confinement in the hospital.

(4) Again, the operation is more easily accomplished with the co-operation of the patient; in the natural position of the parts as when in a sitting posture, hæmorrhage is less difficult to control; better illumination can be maintained; better facilities for seeing more accurately all parts of the cavity during operative procedures—an extremely important feature, and, lastly, all after treatment can be done at the office, a point which also has its particular advantages.

The agents used by the writer are cocain and novocain. The former in a 20 per cent. solution is applied locally, and the latter in a 2

per cent. solution is injected into the parts. The technic of their use will be described later, along with that of the operation.

A certain portion of sinusitis of the maxillary sinus heals spontaneously, and relief of the remaining portion is divided between internal medication, lavage, conservative operative methods and the radical operation.

The causes of disease of the antrum that may eventually require surgical interference may, for the sake of convenience, be divided into two classes; (a) that of dental origin, as a carious tooth or an abscess at the root of a tooth; and, by far the most important, (b) the one that is associated with acute infectious diseases, of which influenza is preëminently the leader.

Obstruction of the nasal cavities is so constant in cases that call for operative treatment of the antrum that I cannot pass it by without mention. It is usually in the form of polyps, cystic middle turbinate, or hyperplasia of any or all of the turbinates. A large ridge or spur or marked deflection of the septum may be present, singly or in any combination with the former abnormalities. Any irregularities should be corrected, particularly on the side of the affected antrum, before the latter is attacked. The antrum operation is rarely so urgent that it cannot wait for this preliminary work; indeed, it is absolutely necessary where, for instance, a badly deflected septum occludes the nasal cavity to such an extent as to make it impossible to carry out the intranasal step of the radical operation.

Conservative operations are so important in certain types or degrees of severity of the diseased antrum that they should by no means be considered lightly, though like many other instances in surgery, they are likely to be overestimated and employed when the radical operation is really the one that should have been selected. Among the operations more frequently used are the Cowper, Dahmer, Canfield's pre-turbinal and the Krause-Mikulicz.

The Cowper Operation consists in entering the antrum through an alveolus. It is little practiced because in many instances good teeth are sacrificed and the condition can be controlled by one of the other methods.

Dahmer's method is to remove the anterior end of the inferior turbinate, create a large opening in the inferior meatus, insuring perma-

RADICAL OPERATION OF THE MAXILLARY SINUS.

nency of this opening by turning a flap of mucous membrane from the nose into the antrum. This is tedious and unnecessary.

Canfield's Preturbinal Operation is to produce an opening into the anterior inferior angle of the antrum by resecting a portion of the bony wall in front of the anterior end of the inferior turbinate, leaving the turbinate intact. It is a little more radical, permits of easier access to the antrum, more thorough inspection, and allows an opening at the lowest possible point of the antrum obtainable through the nose.

The Krause-Mikulicz method is to remove the anterior end of the inferior turbinate and create a large opening from the inferior meatus into the antrum, and it is the most frequently used because of its simplicity and the satisfactory results obtained by it.

A distinct advantage of the Dahmer and Krause-Mikulicz operations is that either of them may serve as the nasal step of a subsequent radical operation, should it become necessary.

The first radical operation of the maxillary sinus was performed by Caldwell and later practiced by Luc, who named it the Caldwell-Luc operation. The principle of this operation is to make a large opening through the anterior wall of the antrum in the canine fossa that will allow free inspection or curetting of the mucosa of the sinus. Another opening is made in the nasal wall under the inferior turbinate to establish permanent drainage of the cavity into the nose.

This operation was again modified and improved by Denker, who included the lower portion of the angle formed by the anterior and nasal walls of the antrum, thus making the opening continuous with the pyriform aperture and nasal cavity, greatly increasing the accessibility to the sinus.

The Denker Operation, since it is the operation of predilection, will be described here as it is applied to all my cases, including the two of which a report is to follow.

TECHNIC OF THE ANÆSTHESIA.

First a 2 per cent. solution of cocain is applied to the gingival mucosa, then to all parts in the nose on the side that is to be operated. Returning to the mouth—infiltration anæsthesia is begun by injecting 6 c.c. of a 2 per cent. solution of novocain into the soft tissues of the canine fossa and into the mucosa of the alveolar process, dividing the solution between four points, as shown in Fig. 1; 1 and 2 are in-

jected under the periosteum of the alveolar process to get anæsthesia of the bone; 3 is injected close to the infraorbital nerve, and 4 is injected into the soft tissues near the zygomatic process.

Going back to the nose, 2 c.c. of the same solution is divided by injections at three points: 1 in the posterior half of the inferior turbinate on its median surface; 2 at the anterior end of the inferior turbinate, and 3 on the floor of the nose under the periosteum in the fossa pyriformis, as in Fig. 2, using in all 8 c.c. of the novocain solution, to

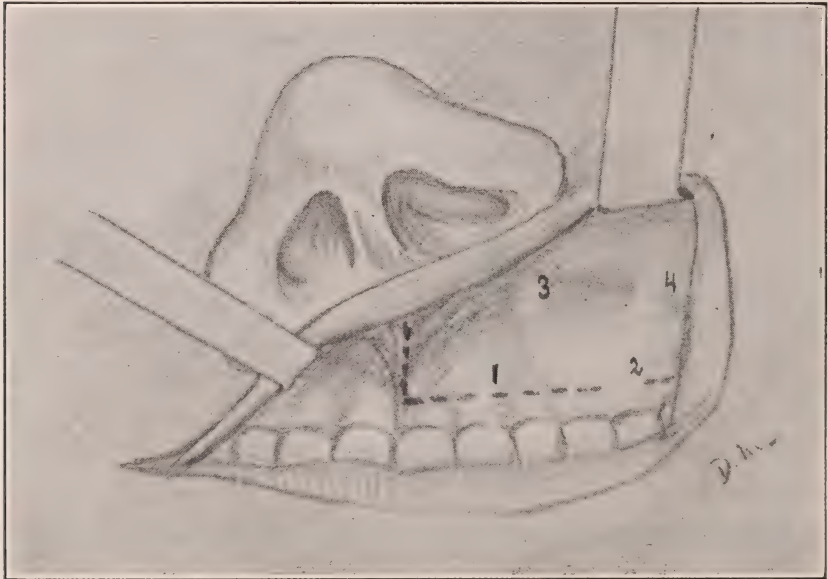


FIG. 1.—Points of infiltration and lines of incision in the mouth for the Denker operation.

which is added four or five drops of adrenalin. This done I wait ten to fifteen minutes before beginning to operate; there is no need to be in a hurry for fear of the anæsthesia wearing off before the operation is completed, as it will last for two or three hours.

TECHNIC OF THE OPERATION.

The patient is seated in an upright posture and the only assistant necessary is the nurse, who prepares the instruments and patient for operation, holds the patient's head and, if she is clever, will hand instruments, tampons, etc., while holding the head. Ten or fifteen minutes having elapsed since the anæsthesia was completed the first step in the operation is taken by making a vertical incision in the medium

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line through the frenum to the fossa pyriformis. Then a horizontal incision down to the bone is carried outward to the second molar tooth, as represented by the dotted line in Fig. 1. The soft tissues are then separated from the anterior bony wall of the antrum, fossa pyriformis in the floor of the nose, and the antero-lateral wall of the nose to the under surface of the inferior turbinate, by means of periosteal elevators. The sinus is now entered through its anterior wall by the aid of an Alexander chisel and Hajek's sinus forceps, removing first a portion of the anterior wall of the sinus, then a part of the frontal process of the maxillary bone, extending the opening laterally to the outer limit of the sinus below to its lower margin and above as far as is safe and convenient, making an opening into the mouth, as shown in Fig. 3. This done the operator is able to study the condition and contents of the cavity.

At this stage another precaution must be taken by packing the cavity with gauze containing a 20 per cent. solution of cocain and four or five drops of adrenalin, 1/1000; this is allowed to remain ten minutes, at the end of which time the operator may proceed with the removal of any diseased tissue, etc., in the antrum, painlessly, except at two points; namely, around the infra-orbital nerve, indicated by (3) in Fig. 1, and along the posterior-superior portion of the nasal wall.

Curettage of the sinus is usually rather tedious by reason of free bleeding from the mucosa; this can be controlled nicely by packing the cavity tightly with gauze saturated with peroxid of hydrogen, waiting a few minutes and repeating as often as necessary. While removing all the diseased mucous membrane in this, care should be taken not to remove any that is normal.

Communication is now made with the nose through the mucous membrane of the nasal wall from the antral side by a vertical incision in front, and one posteriorly at the middle of the inferior turbinate, joined by a horizontal incision along the under surface of its attachment—shown by dotted lines in Fig. 2. A flap is turned in and placed on the floor of the sinus to establish a permanent opening and encourage relining of the cavity with mucous membrane. The opening is further enlarged by removal of the anterior half of the inferior turbinate with the use of a pair of bone scissors and a snare, the incisions being indicated by the solid lines in Fig. 2.

The result of this procedure is shown in Fig. 4, where the anterior half of the inferior turbinate is resected and the mucous membrane flap from the inferior meatus is turned into the sinus, a portion of the stump of the inferior turbinate being illustrated in Fig. 3 between the nasal wall and the upturned lip.

The cavity is packed with iodoform gauze, preferably two pieces.

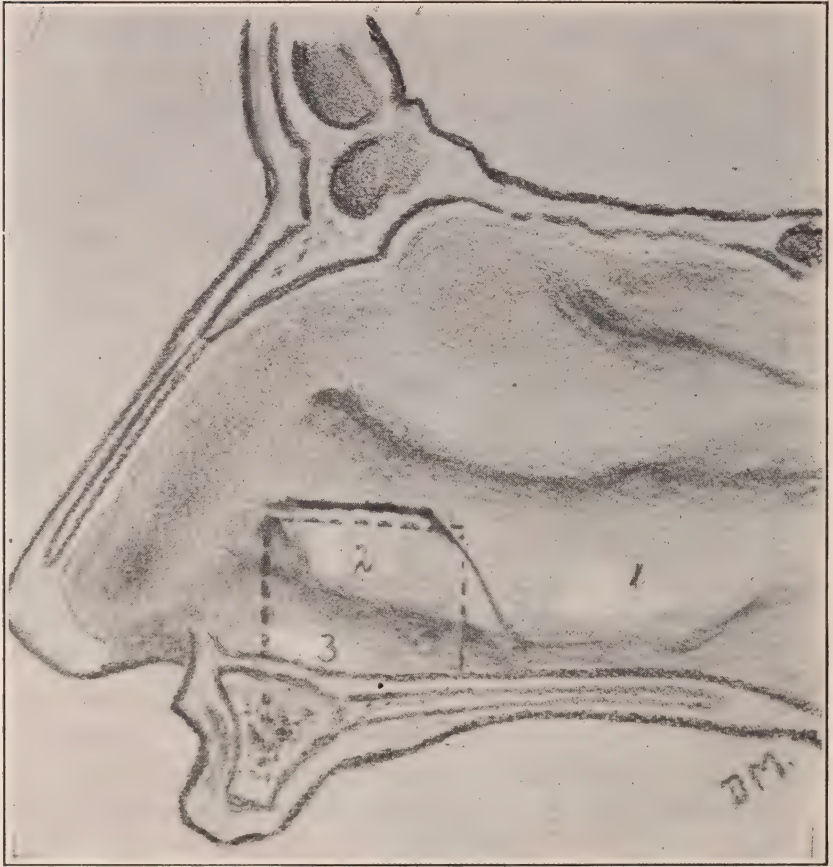


FIG. 2.—Areas of infiltration and lines of incision for the intra-nasal step of the Denker operation.

The first one is introduced through the nose to anchor the flap of mucosa to the floor of the sinus. The second one is inserted through the opening in the canine fossa, allowing one end to protrude from an opening retained at the outer angle of the wound, the inner two-thirds of which is closed by three silk sutures—being careful that the attachment at the frenum in the median line is straight. A small pad of plain gauze is placed over the wound between the lip and canine

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fossa to make pressure, and a pack of plain gauze is put in the anterior part of the nose.

The patient is not allowed to leave the office under one hour after the operation. He may walk about but is not permitted to lie down during the first twenty-four hours for fear it may cause coughing, gagging or bleeding; he rests and sleeps in a large easy chair. Alcoholic stimulants are forbidden and all warm food withheld for twenty-four hours, only cold liquid diet being taken.

On the second day the gauze in the nose is removed and the patient observed. The packing in the sinus is removed on the fourth

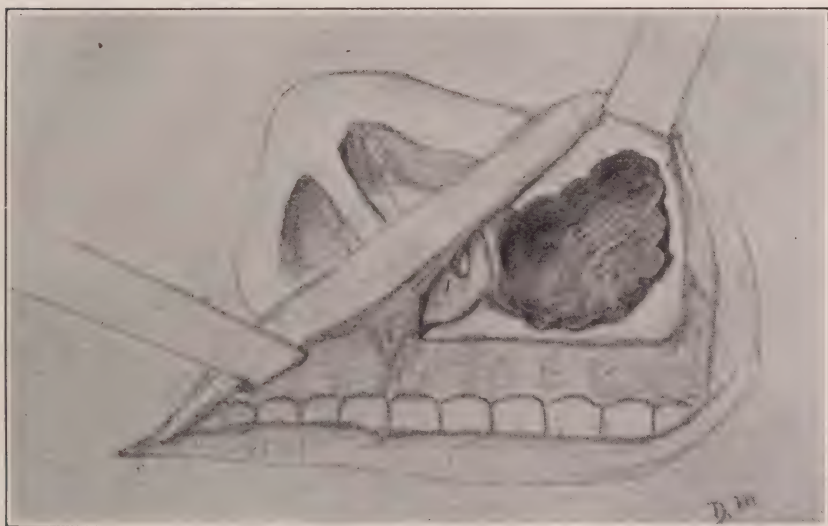


FIG. 3.—Opening thru the anterior and nasal walls and removal of the anterior-inferior angle of the antrum, also a portion of the stump of the inferior turbinate.

day, through the opening in the mouth, and on the sixth day the sutures are removed. Daily washing of the sinus follows until the secretion diminishes sufficiently, when it may be done once in two or three days—final healing taking place in one to six months. No external deformity need follow this operation at any time.

The following two cases upon which this operation was performed were selected because they contain a number of special and interesting features.

Case 1. Sept. 29, 1914. A. H., female, age 35 years, complained of

frontal headache, discharge from the nose posteriorly and anteriorly, obstruction to breathing, anorexia and constant indigestion with loss of weight. Examination of the nose showed a deflected septum in contact with the left middle turbinate, polyps under both middle turbinates and pus on both sides of the nose coming from under the middle turbinates. Within the next two months I did a submucous



FIG. 4.—Communication of the antrum with the nose by removal of the anterior half of the inferior turbinate antero-nasal wall and turning in of the membranous flap from the inferior meatus.

resection of the septum, removed polyps from the right side and the anterior end of the middle turbinate and polyps on the left; also a subsequent removal of polyps on the left side.

The patient left me and did not return until January 18, 1915, nearly two months later, and nearly four months after the time I first

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saw her. She complained of a discharge from the nose, anorexia, cough, indigestion, frontal headache and loss of weight. Transillumination showed both sinuses to be dark and both frontal sinuses comparatively clear. Puncture and washing showed both antrums to be positive; also the left frontal sinus was positive. Frequent washing of them for one month showed indifferent results. A microscopic examination of secretion from both antrums was negative for the right side, and the left showed a pure culture of streptococci. Injections of Sherman's vaccine, No. 22, were given for six weeks without result, when I decided to do the radical (Denker) operation on the left maxillary sinus; this was carried out precisely as described above, May 13-15. The operation was a painless one with two exceptions—according to the patient, who said there was some pain on removal of the nasal wall and during the curetting of the upper mucous membrane from the sinus. Bleeding from the sinus was not profuse and it was easily controlled by peroxid tampons.

A perfect view of all parts of the sinus cavity showed it to be of moderate size, with no pocket; a pool of pus lying on its floor and the mucous membrane of the roof and upper portion considerably thickened, gray and spongy, with some polypoid degeneration. All was diseased; hence, all was removed.

May 15, 1915. Two days later the patient reported at the office in good condition: some edema under the left eye; mild soreness and slight swelling of the face on the same side.

May 17, 1915. Fourth day after operation. Patient said she had pain in the sinus yesterday which was gradually relieved by the use of the hot water-bag. The packing was removed, with little pain or bleeding, by free use of peroxid and water in the cavity, which was clean and odorless. Two days later the sutures in the mouth were removed and the patient returned almost daily for lavage; within one month the sinus was negative as it has since remained. In two weeks after the operation her headaches and indigestion had permanently disappeared and she began to take on weight.

There have since been polyps removed from the right side of the nose and a Krause-Mikulicz operation done on the right maxillary antrum, with cure. Two intranasal operations (Good's and Mosher's) were done on the left frontal sinus without result. One month after

the last (Mosher) operation she developed symptoms of pulmonary tuberculosis. I sent her to Dr. Weston D. Bayley, who confirmed my suspicions. She was sent to the country and advised to have Roentgen ray treatment, which she has received regularly from Dr. J. W. Frank, and is now in a fair way to recovery.

Case 2. April 15, 1915. Female, age 34 years. Gave a history of marked nasal obstruction for as long as she can remember, and is greatly annoyed by a large amount of secretion from the nose and dropping posteriorly, loss of sense of smell and partial loss of sense of taste—for which she sought relief. There were practically no other subjective or general symptoms.

Examination of the nose showed an exceedingly large right middle turbinate (which I suspected was cystic and which later proved to be), that was pushing the septum into the left middle meatus, blocking the passage, and obliterating the left middle turbinate from view—which, as seen later, contained polypoid degeneration. Both inferior turbinates were hyperplastic and on both sides of the nose streams of pus were noted, but its source could not be accurately located because of the crowded condition of the nasal cavities.

On removal of the anterior half of the right middle turbinate it presented a large cavity (cyst) with sessile polyps along the unciform process.

April 19, 1915, four days later, I removed the posterior half of the same turbinate in order to get better drainage and more room in the right side of the nose.

April 25, 1915, I did a submucous resection of the septum, which subsequently became swollen (no hematoma)—probably due to a mild infection from the pus in the nasal chambers. I turned my attention now to the sinuses, and upon washing them out found that both maxillary sinuses contained a large amount of foul-smelling pus. The right frontal and left sphenoid sinuses by washing were proven to be positive. The ethmoids of the right side were extensively diseased and those of the left side less morbidly so; the right sphenoid and the left frontal are the only sinuses that seem to have escaped. The only improvement was a decrease in the amount of discharge from all the sinuses under treatment, including the right frontal sinus, upon which I operated May 27, 1915, after the method of Good. A bacteriological

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examination of the pus from the left maxillary sinus revealed streptococci and bacilli in great numbers. I then decided that there was nothing to gain in further delay of operation, and on June 2, 1915, I did a Denker operation which proceeded practically the same as that in Case 1.

A good view of the interior of the sinus showed pus on the floor, a much thickened, whitish, spongy and polypoid mucous membrane under the orbital wall and around the upper, outer and posterior portion of the cavity, while that on the floor and nasal wall was in fairly good condition. The patient complained of a little pain on two occasions; namely, while curetting close to the infraorbital nerve, the pain extending to the eye, and while elevating the mucosa in the fossa pyramidalis. Bleeding was not excessive though I did not use adrenalin in the cavity.

June 4, 1915. The second day after the operation the patient reported at the office with the left side of the face slightly swollen; otherwise O. K. On June 14, 1915—twelfth day after operation with daily lavage—the sinus was negative, and on this date the patient complained of intense pain along the lateral wall of the nose and under the eye, together with numbness and swelling of the left cheek—all of which disappeared in one week under the influence of "high frequency."

June 7, 1915, I did a Krause-Mikulicz on the right and less diseased maxillary sinus, and at this writing both maxillary sinuses are negative despite the constant presence of pus in the nose from the other diseased sinuses—for which she temporarily at least refuses surgical interference—and her senses of taste and smell are fully restored.

The leading indications, then, for the radical operation as shown in these two cases, are history of a long-standing emphysema that resisted all treatment, marked thickening and polypoid degeneration of the mucous membrane in the cavity of the sinus, and extensive polyp-formation in the nose. They also serve to show some of the different as well as similar conditions that exist in different patients with the same disease; for instance,

Case 1 presented less nasal obstruction, fewer sinuses involved and marked secondary symptoms as the result of toxemia; while Case 2 was an extreme example of associated nasal obstruction, with nearly

all of the sinuses involved, and only two secondary symptoms, which were really due to the nasal obstruction. Both had nasal polyps and pus indicative of a long-standing empyema. The mucosa of the sinus cavities was degenerated to about the same degree and in both instances located at the typical points, which are the upper part and roof of the cavity.

Again, both cases substantiated the fact that the two points where some pain is experienced are around the infra-orbital nerve and along the nasal wall, and, lastly, they proved that an operation on the antrum can be a success when there is pus in the nasal chambers from other diseased sinuses.

Furthermore, it is convincing that cocain in any strength up to and including a 20 per cent. solution applied to thick, soggy, degenerated, polypoid mucous membrane is not absolute in effect. Therefore, gentleness in curetting the cavity is a most essential precaution for the comfort of the patient.

In conclusion, I want to take this opportunity to extend hearty thanks to Dr. Douglas Macfarlan, and compliment him on his skill and accuracy in the execution of the accompanying illustrations.

183^r Chestnut Street.

DEFLECTED SEPTUM AS A CAUSAL FACTOR IN SINUS DISEASES

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Philadelphia.

SINCE the advent of the sub-mucous resection of the nasal septum, and with the data in the hands of the rhinologist, there is no doubt as to the benefit derived in the treatment of the obscure catarrhal condition, and more especially of sinus empyema, through the correction of the septal deviations.

Since deviations of the septum are frequently overlooked by the general practitioner as a possible factor in the cause of sinus conditions, and because of the satisfactory results obtained in a number of cases, the subject of this paper suggests itself to the writer.

The etiology of inflammation and empyema of the nasal accessory sinuses may be divided into the predisposing and actuating, and after a series of some five hundred cases I am rather inclined to classify deviations of the septum as one of the chief causes, and this because of the anatomical relation of the septum to the sinus usually involved.

Among the actuating causes may be mentioned infection by influenza bacillus, staphylococcus, pyogenes,—aureus and albus, and micrococcus catarrhalis. The inflammatory process in the sinus may be due to direct extension from the nasal cavity or naso-pharynx.

Since, however, the object of this paper is to show the relation of sinusitis to deviations of the septum, I shall purposely omit going into detail concerning other causes at this time.

We are familiar with the anatomical structure of the nasal cavity, and appreciate the fact that the mucous membrane of the nose is divided into three sharply defined regions: The first, that which lines the vestibule and which is a continuation of the external skin; the second covering the largest portion of the nasal and accessory cavities, which show ciliated epithelial cells, mucous glands and the swell bodies; the third, which is the smallest portion, contains the specific

terminations of the olfactory nerve, is thinner and is composed chiefly of olfactory cells.

Realizing that the nose is not only an organ for the sense of smell, but plays an important part in respiration, we can readily appreciate how anything deviating from the normal would necessarily inhibit the physiologic functions and bring about various pathological changes.

Just how a deviation of the septum acts as a causal factor in sinus disease is not difficult to understand when we recall the types of deviation and the natural sequences. Considering the structures which compose the septum we have, first, the cartilaginous deviation; second, the osseous deviation, and third, the various combinations of these.

While opinion may vary as to which of these plays a more prominent part in the etiology of sinus disease, with my limited experience I am inclined to the opinion that the cartilaginous deviation seems to give the greater trouble. Bearing in mind that cavities lined with mucous membrane are always predisposed to inflammation, we can more readily appreciate the natural sequence when any part of the cartilaginous or bony structure of the septum occludes, even to a small degree, the area about a normally small ostium.

Regardless of the character of the deviation the pathological changes in the sinuses in the presence of the various microorganisms are much the same, namely, retained secretion which undergoes purulent changes, and, if the retention is prolonged, pathologic changes in the bone itself.

While space will hardly permit my going into details concerning the various types of deviation, yet I wish to mention the apparently moderate deviations, since they are frequently overlooked. In these cases the patient rarely complains of any nasal obstruction; yet in these very cases I have found numerous instances where though the deformity was of mild grade, it was found to be the principal cause of the trouble, the correction of the deviation resulting in prompt clearing up of the sinusitis.

Considering the deviation as a factor in sinus disease, and since as in all other surgical conditions we must first remove the cause, let us consider the steps which may be taken. There are numerous operations, such as the Gleason, the Bosworth, the Sluder and the submucous resection. The last mentioned in my opinion may be em-

ployed in any type of deviation. In my experience, the following technique has given the most satisfactory results.

The mucous membrane on both sides of the septum is carefully touched with the 20 per cent. solution of cocain, and after a few minutes' pause this is repeated, after which a thin layer of cotton dipped in adrenalin, 1 to 1000, is placed on both sides of the septum. In very nervous patients or patients whom I suspect to be susceptible to the effects of cocain, one-quarter of a grain of morphin combined with 1/150 of atropin sulphate is administered by mouth.

The patient is then requested to sit in the outer office for fifteen or twenty minutes; during this interval I am at liberty to see other patients, and at the same time have my assistant prepare for the operation, using, as in all other operative work, the strictest asepsis. The patient is again taken into the treatment room, the adrenalin strips removed and if any tender spots are found, another application of 20 per cent. cocain is applied.

Next, an injection of a few drops of 2 per cent. solution of novocain at the junction of the skin and mucous membrane is made, thus rendering the operation painless.

Being satisfied that anæsthesia is complete, I now proceed with what may be considered the most important step of the whole operation, namely, the Hajek incision, or, as I term it, the Mackenzie incision, since this is the one step which he lays so much stress upon in his teaching. The incision, unless properly done, results in prolonged and needless manipulations and quite frequently in tears or perforations. Here, great care must be taken to have this next incision carried well down to the cartilage, and this being accomplished a complete dissection is done with a few rapid strokes from before backward with a blunt dissector.

The next step is to make a clean cut through the cartilage to the mucous membrane of the opposite side, and with a blunt dissector a rapid dissection is again made as on the first side.

Having thoroughly freed the membranes on both sides the cartilage is engaged between the two blades of a nasal speculum; then with a pair of pointed scissors a nick is made in the cartilage as high up as may be necessary to remove the deviated portion. This incision in the cartilage is continued with a small swivel knife. With the

speculum still in place, all the deviated parts are removed, the flaps are replaced and then retained in place by the Simpson sponge splint on both sides. The placing of a small nasal tube on one side allows the patient greater comfort than without it.

It is my custom to remove all dressings the day following the operation.

While no one should ever attempt to make a record for time in this or in any other operation, yet this like all operations should be done as thoroughly and expeditiously as possible. Following the above technique, ten to fifteen minutes is usually required.

While we have many instructive cases of sinus disease, I would like to take this opportunity of pointing out one or two recent cases that bear out the subject of this paper.

Mrs. D., age 37, presented herself for examination September 17, 1914, complaining of constant accumulation of discharge in the posterior nares, and despite various and prolonged treatments she did not seem to improve. Examination revealed a deviation high up in the region of middle turbinate which interfered with the proper ventilation of the sinuses and resulted in infection. By removing the deviation the sinus conditions promptly responded to treatment.

Mrs. H., age 40, with a history of asthma for many years had tried all kinds of treatment, and was advised by her family physician to submit to an operation for a septal deviation. The deviation was high up and combined with a severe frontal sinus infection.

The end result was marked improvement in the patient's general health, as well as her local condition, and for the first time in years, she was free from asthmatic attacks. She has continued to improve up to the present time.

I might continue the citation of a number of similar cases, but they would only afford further corroborate evidence of the claims already set forth in this paper.

From the data at hand, we can fully appreciate the fact that deviations of the septum are frequently the cause of sinus involvement and little or no result may be hoped for until they are first corrected.

In conclusion, may I urge that more minute inspection be made and greater study given the *apparently mild* forms of deviation, since attention to them will frequently give us such satisfactory re-

DEFLECTED SEPTUM IN SINUS DISEASES.

sults and thereby save the patient from more radical measures in which we too often witness such unfortunate results as marked deformity, diplopias, loss of sight, etc.—where the end results are so much worse than the original condition for which patient sought relief.

1338 Spruce St.

A CASE OF LEONTIASIS OSSEA OPERATED FOR OBSTRUCTIVE NASAL RESPIRATION*

BY G. W. MACKENZIE, M. D.,

Philadelphia.

LEONTIASIS ossea, also referred to by some authors as Hyperostosis cranii, was first described by Virchow, who examined six such skulls in the museums of Europe. Baumgarten believed that some of these skulls may have been cases of acromegaly. According to Osler and McCrae (*Modern Medicine*, Vol. 6, 1909, p. 728) General hyperostosis, Hyperostosis of the skull—Leontiasis ossea (Virchow): "In these conditions the distribution of hyperostosis is in nearly all cases fairly general. In those cases termed 'general hyperostosis' the skull is usually more affected than the rest of the skeleton, and in the cases termed hyperostosis of the skull the condition is general, but over the rest of the skeleton of a grade so mild that it is easily overlooked."

Morton Prince, "Osteitis Deformans and Hyperostosis Cranii," (*Transactions of the Association of American Physicians*, Vol. XVII, 1902), inclines to the belief that we have no sure ground for differentiating Hyperostosis cranii from Osteitis deformans and that these two conditions are probably manifestations of one and the same process.

The general consensus of opinion favors the following definition, which is borrowed from Park (*Treatise on Surgery by American Authors*, condensed edition, 1899), that Leontiasis is a diffuse bilateral symmetrical hypertrophy of the bones of the face and later of the cranium, the real origin appearing to be in the superior maxilla.

Osteoma may be differentiated from leontiasis by reason of the fact that in osteoma we have a true tumor formation, circumscribed, and it is very unlikely to be bilaterally symmetrical.

Typical Osteitis deformans may be differentiated from Leontiasis in that it begins later in life, is usually associated with pain and affects commonly the long bones of the skeleton. Leontiasis on the other

*Read before the Philadelphia Laryngological Society, November 2, 1915.

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hand is limited to the face and skull, and if the other bones of the skeleton are involved they have thus far escaped detection even by those few authors who are inclined to accept the view that Leontiasis and osteitis deformans are the results of one and the same process.

No doubt some cases of Leontiasis have been mistaken for acromegaly and vice versa. As an aid in the differentiation we may recall the fact that in acromegaly the enlargement of the face and skull results from a general increase in the size of all the tissues which go to make up the head and face, with particular emphasis laid upon the lower jaw; while in Leontiasis the increase in size of the face and head is less pronounced and results merely from an increased thickness of the bone, with particular emphasis laid upon the superior maxilla and malar bones. In acromegaly all the long bones, particularly those of the hands and feet, participate in the overgrowth, whereas in leontiasis they are exempt.

In Leontiasis certain characteristic changes take place in the structure of the bones of the face and head that are found in no other condition. These are broadening and flattening of the nose, especially between the orbits, narrowing of the aperture pyriformis and diminution in the size of the orbits, all of which are illustrated on page 539 of Park's Surgery, referred to above. The illustration is from a photograph taken of a skull of a Chinese woman (U. S. A. Museum, No. 10620). These characteristics are duplicated in the case which I am about to report. It takes but a slight stretch of the imagination to see the typical skull through the face of my patient and the likeness is confirmed upon examining the roentgenogram.

As a result of the ever increasing thickening of the bones in Leontiasis the nasal accessory sinuses eventually become obliterated, the foraminae that transmit nerves and blood vessels become narrowed, interfering with function and nutrition, and if the case survives long enough the jaws become ankylosed. Accordingly we may find late in these cases a great variety of symptoms about which we are not concerned at present, for my especial object is to report a case operated for the relief of obstructed nasal respiration.

The case was first seen by me in conjunction with Drs. J. W. Pettigrew and Ellwood Matlack, to whom I am indebted for some of the data and assistance at the operation.

G. W. MACKENZIE.

The patient, F. McC., male, age 40 years, was first seen by me September 14, 1914.

Family history good; furthermore, he has four children living and healthy; none dead.



No. 1



No. 2



No. 3



No. 4

Photographs of the patient taken at different ages. A comparative study of them shows the changes in the face at the different ages. No. 1 was taken at the age of 14 years; No. 2 at 19 years; No. 3 at 28 years; No. 4 at 41 years.

A careful study of No. 4 will reveal the U-shaped line of incision referred to in the text. Note also that the size of the cranium is not increased. In fact, the patient claims to be wearing at the present time the same sized hat that he wore at the age of twenty.

Present History. The patient is aware of the fact that his face

is not normal. He states further that the condition began in childhood—about the tenth or eleventh year. He comes especially because he cannot breathe through the nose and has a feeling as though he had a constant cold with dropping of secretion in his throat. The nose never bleeds. He was operated twelve years previously for obstruction in the nose, with temporary improvement. His nasal obstruction during the last year has increased so decidedly that at the present time it is impossible to get air through either side. He has lost no weight. He complains of excessive watering of the eyes. He claims to have normal vision and hearing. He was not aware of any overgrowth of bone in any other part of his skeleton, nor could I detect any.

Upon examination the nasal cavity appeared to be entirely blocked, except for a very small, somewhat tortuous fissure that corresponded to the location of what was originally the septum. The two lateral walls had met in the midline, causing a pressure atrophy of the septum with complete destruction as far as could be seen (about 2 cm.). After shrinking the mucous membrane with cocaine and adrenalin it was possible to introduce the finest malleable probe into the fissure for a distance of 1.5 cm. Through this fissure issued a white, creamy secretion, and an occasional bubble was seen upon forceful blowing of the nose. The inferior turbinate bodies were hypertrophic, evidently sharing in the process with the other bones. The mucous membrane covering them was in fairly good condition, notwithstanding. The same character of secretion issued from the lachrymal punctæ. No attempt was made to slit the canaliculæ and probe the naso-lachrymal ducts. Ocular and palpebral conjunctiva were moderately congested and muco-purulent secretion was present in a fair amount in the cul-de-sac of both eyes. Exophthalmos was present in both eyes. O. D. protruded 5 mm. beyond the supra-orbital margin; O. S. protruded 3 mm. The eyes moved well and together in all directions. Convergence good. Right pupil a trifle smaller than the left but both reacted promptly to light, accommodation and convergence. Eye grounds normal. Vision without correcting lenses O. D. 6/5; O. S. 6/5 full.

The external appearance of the nose was flat and broad between the orbits. The margins of orbits by palpation appeared to be generally smaller than normal, and consequently the distance between the

inner margins was increased. This was subsequently proven by a skiagraph which shows both orbits involved in the process. The superior maxillæ were enlarged and the malar bones prominent. The skin and soft parts of the face were normal and freely movable over the underlying bone.

It was decided to remove a small fragment of bone from the superior maxilla for microscopic study. Accordingly under cocain infiltration a flap was prepared as for a Luc-Caldwell operation in the left canine fossa. My intention was also to get into the maxillary sinus if possible and study its condition. The bone was found to be ivory-like. With the greatest difficulty, using a sharp chisel and mallet, a piece sufficiently large for examination was obtained, after which I succeeded in boring a funnel-shaped hole 1.5 cm. deep without entering the cavity of the sinus. By this time the patient because of the jarring of his head objected to further procedure at this sitting.

A roentgenogram was then made which showed the characteristic findings of a case of Leontiasis ossea. The patient asked to be operated under ether for the relief of his nasal obstruction.

OPERATION.

October 14, 1914. The patient was operated under general ether narcosis, administered by R. Franklin Hill. Operation lasted three hours, which was made possible no doubt by his excellent method.

A U-shaped incision was made, beginning at a point below the inner canthus of the left eye, through the skin and soft parts down to the bone. The incision was carried downward and slightly outward along the line of attachment of the nose to the cheek to the lower angle of the nose, from thence it was carried horizontally across and below the nose to the corresponding angle on the right side, avoiding the orbicularis oris muscle. From the right lower outer angle of the attachment the incision was carried upward on the right side to a point just below the inner canthus of the right side. With the periosteum elevator the nose was detached from the face as far as the U-shaped incision would permit and drawn upward and to the right away from the field of operation.

The first thing that impressed me was the extreme narrowing of the aperture pyriformis. I might add that the margin of the aper-

ture was not smooth and sharp as in the normal, but was irregular and rounded. There was no well-defined edge. The surface bone was freed of periosteum and an attempt made to enlarge the aperture. Our first efforts were with a large dental burr driven by 1/8 horse power electric motor. This was found to be an exceedingly slow process; nevertheless we continued its use feeling that it was the safest means to employ. After twenty or thirty minutes the aperture was enlarged perhaps 2 mm. in all directions, adding considerably to its total size but to less than normal.

Realizing that to bore a hole through the nose without preserving the mucous membrane would be followed by cicatrization and occlusion, I therefore attempted to dissect up the mucous membrane from the turbinates and lateral wall before attacking the bone in the nasal cavity. My effort was to operate submucously. The mucous membrane was preserved even better than I had anticipated and the results were correspondingly gratifying.

The burr worked very slowly and heated up early, so that we were compelled to cool it off frequently. We began with three burrs and these were used up about the same time that the motor stalled for good. A dentist who was watching the operation promptly loaned us his outfit, and we proceeded with foot-driven engine until we fagged out all the available assistants, when this method was abandoned. Alexander chisels were then adopted, using the number 10 size. The bone was literally as hard as ivory. At the end of two and a half hours an opening was forced to the naso-pharynx. A small curette was passed to ream out the posterior opening, when suddenly the patient stopped breathing and began to show signs of cyanosis. An assistant put his finger into the pharynx and pulled out a mass of adenoids that had been freed by the curette. The adenoid tissue was equivalent to the medium sized ones found in children. With this removal the patient returned to his former good condition.

A final half hour was spent in reaming out the opening, so that eventually there was an opening through the left side of the nose sufficiently large to admit the adult little finger. Owing to the length of time required and the success obtained it was decided to conclude the operation.

At the conclusion of the operation I was able to satisfy myself

that the septum had completely disappeared as a result of the process, except at the extreme posterior margin.

Near the conclusion of the operation bleeding was fairly profuse, probably from the vault of the pharynx, because of the removal of the adenoid tissue. This, however, was promptly controlled by pressure with gauze covered finger tip.

A firm packing of gauze was applied to the inside of the nasal cavity with the object of reapplying the mucous membrane and holding it in place. The external nose was reattached to the face and sutured with silkworm gut and a light gauze dressing applied and held in place with adhesive strips.

The highest temperature (99.3°) was recorded on the third day, after which it fell to normal and remained there. The first redressing was on October 17th.

On October 19th after removing the stitches and redressing, the patient was discharged from the hospital with instructions to report to the office for further treatment. Until November 5th the patient was treated daily at the office. On one or two occasions nitrate of silver, 10 per cent. solution, was applied to a few small granulations.

Packing of the nose was discontinued October 21st. The following morning the patient reported that he felt good, could breathe fine and that his wife told him he had slept well and quietly, something that he had not done for many years.

From October 29th Dr. Matlack took care of the case and conducted the after treatment, which consisted of cleaning the nose and using argyrol tampons every few days.

He was last seen December 15th, when he expressed his gratitude at the satisfaction he had obtained from the operation, and said that should he have a recurrence of his former symptoms he would not hesitate to have it remedied promptly.

We lost sight of the patient from December 15, 1914, to November 1, 1915. During the interim he had been out of the city.

When he reported at this later date I took occasion to question him as to his condition during the last ten months. He reported that excepting for a slight cold in the head during the last two or three weeks he was doing well. On closer questioning, he said that perhaps his breathing through the nose for the last month or so had not been

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quite so good as it was immediately following the operation, but that it was decidedly better than it was prior to the operation. He volunteered the information that he was free from the headache and sense of pressure deep in the nose that had been with him constantly before operation.

Upon questioning him concerning abnormal thickening or overgrowth of bone in the rest of his skeleton, he denied any, nor could I detect any by careful palpation through his clothes. The patient was not stripped for the examination. He claimed, as on the first visit, to have normal hearing and vision, and added that his sense of smell and taste were poor. He never saw double; never had tinnitus or vertigo. Examination as far as I went revealed the following findings:

The passage through the nose was reduced to perhaps two-thirds what it was. A month after the operation the greater narrowing seemed to be about half-way back in the cavity, which narrowing formed a sort of isthmus. The left lateral wall, which was somewhat irregular, apparently had not moved toward the median line but the right had. Furthermore, the right lateral wall, or rather the inferior turbinate region, had begun to invade the left side. This fact led me to conclude that the narrowing of the nasal cavity following the operation was due to the continuance of the pathologic process of overgrowth from the unoperated side, and that the impeded progress on the left side was most likely due to the operation having been performed on that side. If I could accept this as a positive fact it would offer us encouragement to operate again after the same method as before, choosing the right side.

Examination of the eyes revealed an undue prominence of both eyes. The right eye protruded 3 mm. beyond the supra-orbital margin, taking the measurement from a vertical line dropped down the supra-orbital foramina. The left eye protruded 5 mm. The palpebral fissures are about normal and equal on the two sides. There is pronounced epicanthus on both sides. Lacrimal punctæ normal so far as position in relation to the globe is concerned, but the tear duct apparently occluded by the bony overgrowth. Palpebral and ocular conjunctiva were moderately congested and the lower cul-de-sac of both eyes

contained some flocculent secretion. Ocular movements normal. No diplopia in any of the fields.

External eye findings normal with the exception that the right pupil was a trifle smaller than the left; however, they both reacted



Skiagraph 1, side view, was taken by Dr. Douglas Macfarlan a few days before operation.

normally to light, accommodation and convergence.

Ophthalmoscopic examination revealed normal eyegrounds.

A CASE OF LEONTIASIS OSSEA.

Vision O. D. 6/5 full; O. S. 6/5 full. Fields not taken. Inter-pupillary distance 59 mm.

The photograph of patient, taken in November, 1915, shows the



Skiagraph 2, side view, was taken in November, 1915, by Dr. J. W. Frank. By comparing No. 1 with No. 2 it will be noted that there is no apparent increase in the size of the area involved. Note also that the Sella turcica is of normal size, eliminating acromegaly.

external appearance of the face better than I can describe it in words. The skin and soft parts looked and felt normal.

Examination of the ears shows slight diminution of the hearing on the left side, which the patient states is of long standing. The fork tests show the diminution of hearing to be due to a catarrhal process in the middle ear, and not the result of any involvement of the inner ear or nerve, for the Rinne is negative, Schwabach increased, and Weber to the affected side. This conclusion was further borne out



Skiagraph 3, front view, was taken on the same date as No. 2, and by Dr. J. W. Frank. This photograph shows clearly how the pathologic process has invaded the orbits. A study of these pictures shows clearly that the origin of the process was in the superior maxilla, and that the frontal sinuses are the only sinuses which have thus far escaped invasion by the process

by the otoscopic findings, which showed opacity of the membrane with retraction. The hearing and otoscopic appearances on the right side were quite normal. No symptoms or signs were present indicating any abnormality of the vestibular branch of the VIII nerve.

There were no disturbances in tactile or pain sense in the dis-

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tribution of the V nerve; no motor disturbances in the mimic muscles. The sense of taste was slightly diminished; movements of the soft palate were normal; deglutition normal and protrusion of the tongue normal.

Heart-beat in sitting position 80 per minute, normal in rhythm and no adventitious sounds audible. No disturbances of tactile, thermic or pain sense in any part of the body. No apparent diminution in strength in any of the muscles; deep reflexes normal and no incoördination in movements.

I was interested to learn what change, if any, had occurred in the bony overgrowth during the last ten months as ascertainable by a comparison of roentgenograms. Accordingly I sent the patient to Dr. J. W. Frank, of Philadelphia, who made two, one front and one side view. Roentgenogram No. 1 was taken by Dr. Douglas Macfarlan just prior to the operation. Nos. 2 and 3 were taken by Dr. Frank in November, 1915. His report is added below. By comparing No. 1 with No. 2 I fail to see any apparent increase in the area of involvement.

DR. FRANK'S REPORT.

I herewith submit report of the Roentgen examination of Mr. F.—— McC.——'s face in which I find an increased bone deposit involving practically all the bones of the face except the inferior mandible. The sphenoid cells are filled up with this involvement. The sella-turcica is rather small. This deposit is rather mottled or granular in appearance, has the appearance of being benign—although it may be malignant. It is encroaching upon the frontal cells to a slight extent; fills up both antrums and the ethmoids and encroaches upon the orbital cavity to some extent.

END OF SYMPOSIUM.

AN ADJUNCT TO OBSERVATIONS ON THE INTRANASAL TREATMENT OF DYSMENORRHOEA

CHARLES A. O'REILLY, M. D.,

Philadelphia.

THE title of this paper may seem somewhat out of the ordinary, but it is merely a further report of the results obtained and the conclusive proof of the inter-relationship between the nose and the genital organs.

In May, 1915, at the request of Dr. Barton Cook Hirst, I was asked to prepare a paper to be read before the Obstetrical Society on the results obtained by me in the intranasal treatment of dysmenorrhœa. This paper was prefaced by a short history of the pioneers who had blazed the trail of the connection between the nose and the genitalia, together with the report of six cases which had come under my own care, and the observations which I had ascertained as to the results accruing from the treatment described (*American Journal of Obstetrics*, October, 1915, pages 634-638).

Dr. Geo. W. Mackenzie invited me to add further to these observations and I am pleased to report the following cases since that time, together with their histories. Before doing this, however, I would wish to call the attention of my readers to my original article, which details the anatomical relationship as well as the method of procedure in the cauterization of the genital spots established in 1897 by Fliess.¹ My attention was first drawn to the relationship existing between these parts by hearing the masterful paper read before the American Academy of Ophthalmology and Oto-Laryngology in 1913, by Dr. Emil Mayer,² who, in conjunction with Dr. Joseph Brettauer, published their results in 93 cases in the *Journal of Surgery, Gynecology and Obstetrics*, in September, 1913, page 381. Dr. Mayer has arrived at the conclusion after the study of these cases,

(1) That permanent relief is obtainable by intranasal treatment in from 50 per cent. to 75 per cent. of the cases; (2) that trichloracetic acid applied to the genital spots four times, at intervals between the

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menstrual periods, is in the majority of cases sufficient to obtain a lasting result; (3) that it affords us a decided additional field for usefulness in our therapeutics.

In the discussion of my paper read before the Obstetrical Society,³ Dr. Edw. A. Schumann relates a case of a relation of his, a girl nineteen years of age, who was not at all neurasthenic, but who suffered with severe dysmenorrhœa from which she was obliged to remain in bed for the first day. The dysmenorrhœa was regarded as being due to a uterine condition or to a cervical stenosis. At a particular time when she was desirous of attending a social function, she was attacked by severe menstrual pains, and reported the same to the doctor, who rather skeptically applied a 20 per cent. solution of cocain to both nasal cavities, without, however, any reference to the genital spots. The pain in a very few minutes disappeared, and she was able to attend the social function that night without any further suffering or inconvenience.

Now as to the number of cases similarly treated since my last report, these unfortunately have not been many, owing to the fact that summer intervened.

Case 1. Mrs. R., age 22, married, since divorced, has had from the commencement of her menstrual epoch painful periods, which were not mentioned by her to me until after the nasal condition for which she first consulted me was corrected. This happened to be a deflected septum, upon which a submucous resection was done on Nov. 4, 1915. Two weeks after the operation, in the course of conversation I was surprised to learn that the patient had always suffered from painful menstruation, the pains radiating down both legs, with considerable pain in the back and a feeling of lassitude. The flow was not profuse. She had always suffered from leucorrhœa. At times just prior to the menstrual period she was compelled to go to bed. Unsolicited she told me that her menstrual period had appeared for the first time after the submucous resection, unbeknown to herself; that she was not aware of its approach until she saw the stain upon her under-garments; that it was a normal flow, lasting for a period of four days without any pain, and that she was able during this time to perform the duties of her occupation. This case was a decided surprise, and a grateful one, as it was referred to me for a correction of the nasal septum,

with no mention made either by the doctor who referred the case or the patient herself in reference to the menstrual epoch. I dwell a little at length on this, as those who care to peruse my original paper, read before the Obstetrical Society, will find that I laid special emphasis upon first correcting any nasal conditions—such as deflected septum, stenosis, hypertrophy of the middle turbinate or enchondroses of the septum, before applying any acid or other cautery to the genital spots in the nose.

Case 2. Mrs. G., age 28 years, married, has always suffered from painful menstruation. The examining gynæcologist reported to me an enlarged, congested, fibrous cervix. This patient was compelled to seek her bed forty-eight hours prior to the appearance of the flow, and even after this time in bed, upon arising would suffer considerably during the entire period. She had been treated for the cervical condition, with practically no benefit. Besides she was very desirous of bearing a child. Of course it is obvious to all that cauterization of the genital spots would have no effect as to insuring a fertile impregnation, but I have brought this forward in order to show that there was no neurasthenic condition existing in this patient which would have had any bearing on her painful menstruation.

Examination of the nose revealed a double deflection of the septum, the anterior deflection being low down, projecting into the left nostril, and the posterior deflection being high up in the region of the middle meatus, projecting into the right nostril. This was corrected by submucous resection; afterward the patient was compelled to resume her duties as a nurse. I have since heard from her husband, however, that the following menstrual periods were painless, and that she was able to perform her duties during the time she was menstruating, suffering no inconvenience or pain as heretofore, from which she had been compelled to seek her bed.

I have under observation at the present time three other cases whose treatments have not as yet been completed, so that a report on these would be fair neither to the treatment nor myself. I shall be glad, however, to report these results in the near future. Had I had a little more time for the conclusive results of the three cases which I have under observation, I would have been able to report them in this

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paper; but Dr. Mackenzie has desired me to have this article in readiness by the first of December.

REFERENCES.

¹Fliess. The relation of Nose and the Female Genitalia. Leipsic, Vienna, 1897.

²Emil Mayer. *American Medical Asso. Jour.*, Jan. 3, 1914, vol. lxii, p. 6-8.

³Chas. A. O'Reilly. "Observations on the Intranasal Treatment of Dysmenorrhœa." *The American Journal of Obstetrics and Diseases of Women and Children*, vol. lxxii, No. 4, 1915.

1829 Chestnut St.

SOME MASTOID SUGGESTIONS*

ALFRED LEWY, M. D.,

Chicago.

THIS paper represents observations from the experience of the writer and others using about the same methods. No claim is made for either novelty or originality.

The first question in mastoiditis is when to operate. Or perhaps I should say when not to operate. Without repeating well-known indications I want to call attention to the fact that there is such a thing as operating too early. The cases in which a mastoid operation is necessary within two weeks of the onset of a middle ear suppuration are exceedingly rare. Operations during this period are, however, not uncommon in the practice of some men. During the early period of mastoiditis the veins are filled with infective thrombi; nature has not yet established her defenses. Operative interference at this time unless it goes wide of the infected area, serves to spread the infection. The cases of stormy post-operative history that I have seen have been almost entirely in the practice of men who operate too early. I have never seen harm come from waiting a few days in a case under careful observation and treatment. A fair proportion of cases recover without operation. On the other hand I do not think it wise to wait too long, say six weeks of proper treatment, in a case with purulent (not mucoid) discharge from the ear, even in the absence of subjective symptoms. In elderly people perhaps four weeks is a safer limit. Nor do we wait for rise of temperature in adults when other good indications are present. In adults rise of temperature often means complications.

OPENING THE ANTRUM.

Some time ago Dr. Norval Pierce, of Chicago, called attention to the fact that in many mastoid processes the cells are divided into an anterior and a posterior group by a sort of buttress of bone ex-

*Presented at the Annual Meeting of the O., O. and L. Society, Chicago, June, 1915.

SOME MASTOID SUGGESTIONS.

tending irregularly downward from the root of the zygoma, shown in the drawings 1, 2 and 3. Figure 4 shows the floor of the antrum, indicating its porous nature. I have also here a few specimens from Hahnemann College collections and other sources, showing this cellular grouping. Specimens 1 and 2 show characteristically relatively solid bone, or at least lack of cellular communication between the anterior and posterior groups until the cells toward the tip are reached. Specimen No. 3 shows an accidental break through this irregular dividing wall in the left mastoid process. There may have been a natural communication at this point, but it is located, as you see, below the floor of the external canal. In this same skull, in the right mastoid process, there is a communication higher up, but out near the cortex, which looks as if it may have transmitted a blood-vessel. No. 4 was simply sawed into, and shows the condition noted by others that the further from the antrum the larger the cells, and indicates the probable course of an infection spreading by continuity along the mucous membrane from cell to cell, assuming that the mucous membrane infection precedes invasion of the bone.

Clinically, it will frequently be found that a fistulous track, if present, proceeds from the floor of the antrum downward through this anterior group of cells toward or into the tip. The infection then may extend further through the lower or terminal cells, backward and upward into the posterior group. From this it follows that the operative approach to the antrum is naturally from below. Following some of the Vienna school, (for I understand that even in Vienna there are some differences of opinion) we do not uncap the antrum, but simply drain from below. The opening is made just large enough to admit a small infant's catheter, which is used as a drain for the antrum and cavum tympani, lightly packed around with gauze.

In a fair proportion of cases it is found that the necrotic process is limited to the mastoid cells, and as one approaches the antrum apparently normal bone, or at least bone that is unsoftened and resists the curette, is encountered. In such cases no special effort is made to reach the antrum. Only such portion of the interior of the mastoid process as is sufficiently softened to come away with the curette is removed (the cortex having been previously removed by mallet and gouge). However, all portions must be carefully inspected and tried,

and every lead of pus or softened bone must be conscientiously followed up and its source eradicated or adequately drained. A method which helps to distinguish healthy from diseased bone is to tampon for a short time with peroxid, followed by a 10 per cent. solution of sodium bicarbonate. The bleeding is thus often controlled, the clots cleaned away, and the healthy bone shows up white or pink, inflamed bone red and necrotic areas black.

Simple drainage of the antrum, without uncapping or curetting it, has not been widely adopted in this country. I believe it shortens the operation, renders less likely accidents to the ossicles, the external semi-circular canal and the facial nerve, and shortens the healing period. When the antrum is widely opened there sometimes results a large mucous-membrane-lined cavity, which is easily subject to reinfection, that is, recurrent mastoiditis. Or sometimes a mucous-membrane-lined fistula remains. In any event, the large communication of the middle ear with the low grade tissue replacing the mastoid cells renders more easy reinfection.

The so-called blood-clot method of closure of the wound has given good results in some hands, but a considerable percentage of failures in others. It is evident that we have not yet clearly outlined its indications and limitations. Our own practice is to limit it to those cases in which the necrotic process is a circumscribed one in the mastoid cells, and to ordinary antrotomies when the diseased process is not widespread. We do not use it when the sinus or dura is exposed, or when the soft tissues are involved, as in subperiosteal abscess. Politzer long ago recommended primary closure in the circumscribed cases. In the blood-clot method the entire wound is sutured, but a small strip of salvaged gauze is inserted about a quarter-inch at the lower angle of the wound, and is left twenty-four or forty-eight hours to relieve some of the post-operative edema. It is not reinserted after removal. The wound is usually healed in ten days. When the tube and packing are used the wound is sutured except about three-fourths inch at the most convenient part of the incision for managing the packing, which is lightly done. The first day or two after operation irrigation with normal salt or boric acid solution is done through the tube, without removing it or the packing. The packing and tube are removed after seventy-two hours. If the canal is dry, or nearly so,

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the tube is not reinserted, nor it is reinserted if it is very difficult to do so. Thereafter the packing is continued as necessary in the usual way.

110 North Wabash Avenue.

*We regret that no cuts were made to illustrate Dr. Lewy's article. His drawings did not reach us and Dr. Lewy authorized the publication of his paper without them.—ED.

Trichinosis Simulating Frontal Sinusitis.—E. L. Pratt, New York, reports (*J. A. M. A.*, Oct. 9th) three cases. The diagnosis was based upon (1) œdema of, and limited to, both upper-lids, (2) negative findings in nose and sinuses, (3) the history, and (4) eosinophilia. In each case the "presenting symptom" was pain in the region of the eye and frontal sinus.

Intranasal Obstruction.—Hooper advances a theory that faulty intranasal pressure can, and often does, cause asthenopia, either ciliary or of the extrinsic muscles. The author, O'Connell, (*J. of O., and O-L.*, Oct.) thinks a nasal examination should be made in every case of optic nerve disturbance, and also where correcting the refraction has not relieved headache or eye pain. Pressure and obstruction within the vicious circle predisposes to sinus disease. "The day of spraying and douching the nose as a *cure* for nasal obstruction and chronic catarrhal manifestations is past."

THE RELATION OF NASAL DISEASE TO HEADACHE*

EVERETT JONES, M. D.,

Boston.

FOR some time past I have studied the association of headache with nasal troubles. Affections of the nose may give rise to pain varying both in intensity and site; sometimes they are described as headaches, sometimes as neuralgia. Patients frequently are referred to me for headache alone where the most careful examination and treatment from their physician or oculist has failed to help them, and they often have no symptoms pointing directly to the nose. Increased experience leads me more and more to the conviction that headache should never be ascribed to general causes until every source of local trouble has been excluded. This applies not only to headache, but to the various other pains which are often described as facial neuralgia.

The pain from nasal affections may be of the most varied kinds; it may be constant or exhibit more or less periodicity. The pain may be described as tearing or as a feeling of pressure on the head: it may be a heavy dull, aching sensation, or sharp and stabbing in character. It may be limited to the frontal region or spread down into the nose, into the upper jaw and teeth and even into the lower jaw. The pain may be described as situated behind the eyes or deep in the head, on top of the head, or at the back of the neck; it may be unilateral or bilateral—more often the former. When it is very severe it is often associated with areas of skin tenderness.

Neuralgia pains in the face are often due to disease of the nose, although there may be no other symptom pointing to this origin. I believe that in nearly every case of facial neuralgia some local cause exists, be it an affection of the teeth, of the upper jaw, or within the nose.

When cocaine is applied to the interior of the nose, as we all know, and especially to the septum anteriorly, the incisor teeth and occa-

*Presented at the Annual Meeting of the O., O. and L. Society, Chicago, June, 1915.

THE RELATION OF NASAL DISEASE TO HEADACHE.

sionally the canine and bicuspid become anæsthetized, and the pain of the nose is not infrequently referred to these teeth. Therefore, it is not strange that pain and tenderness referred to the gums and teeth should be due sometimes to disease of the nose, or that pain in the nose should be due to disease of the teeth.

Headache resulting from sinus affections is one of the commonest and at the same time least understood of all the symptoms associated with the disease. Its mere absence proves nothing, while its presence may be of inestimable value in making a correct diagnosis. Many cases of sinus disease with slight nasal symptoms go through life with the diagnosis of "chronic headache." It is, of course, presupposed that these cases have never had a through rhinoscopic examination.

Although it is impossible to make any exact statement as to the cause of headache due to nasal trouble, the following varieties may be distinguished:

1. Swelling of the mucosa with pressure or irritation of the nerves.
2. Direct contact of the swollen mucosa.
3. Stasis following obstruction of the drainage passages.
4. Negative pressure in the sinus.
5. Re-absorption of toxins formed within the sinus.
6. Ulceration of the mucosa with involvement of the nerves.
7. Any condition which causes active congestion of the cranial circulation, as over-indulgence in alcohol, tobacco, etc.

In my experience I find that direct contact with the swollen mucosa or pressure on the septum from hypertrophies which often coexist with sinus inflammation is one of the principal causes of persistent headache associated with the disease. Pain in the supra-orbital region and down the side of the nose, with superficial tenderness over the painful areas, is usually due to enlargement of the anterior end of the middle turbinate. Pain in the supraorbital region is frequently ascribed to disease of the frontal sinus or is looked upon as a symptom of disease in the ethmoid cells or maxillary sinus; but in many such cases there will be found hypertrophy of the middle turbinate, as the following case will show:

F. W., age 34, consulted me for persistent headache which had

troubled her for seven years, she having been under the care of the best internists, neurologists and ophthalmologists most of that time. Examination showed the middle turbinate hypertrophied and in contact with the septum. Tampons of argyrol would relieve the pain for a day or two, then it would return. I removed the anterior part of the hypertrophied turbinate; the relief was immediate and the pain has not returned. It is now more than two years since the operation.

The exact way in which the pain is produced is open to dispute. It is most likely the result of pressure—the swollen middle turbinate being nipped between the unyielding outer wall of the nose and the nasal septum. The pain may be periodic, depending upon the collapse or swelling of the mucous membrane covering the bone. I have often seen a depression on the septum opposite the enlarged anterior end of the turbinate, showing the occasional existence at any rate of considerable pressure.

Headache or pain exhibiting more or less definite periodicity is very suggestive of trouble in one or more of the accessory sinuses of the nose. The pain comes on gradually, increases in intensity, and then suddenly subsides as the pressure is relieved by the escape of discharge into the nose. Severe periodic pain referred to the top of the head, or a dull heavy feeling of a weight on the head, should excite suspicion of inflammation in the frontal sinus. Pain at the back of the head or back of the neck or situated deep in the head behind the nose, and behind the eyes, should draw our attention to disease in the sphenoidal sinus or posterior ethmoidal region.

Pain and tenderness over the malar bone, pressing upwards to the outer angle of the eye, indicates trouble with the maxillary antrum. The pain of ethmoidal disease is usually referred to the forehead, to the eyes, or deep behind the eyes, or on top of the head; also a dull pain between the eyes should be significant of ethmoidal disease; this is usually accompanied by a sense of weight over the vertex.

Most excruciating pains through the temples are often due to inflammation of the sphenoidal sinus. This sinus with the posterior ethmoid cells also causes varying degree of pain in the occipital region.

In chronic recurrent headaches the Dowling argyrol tampons will shrink the nasal mucosa, stimulate ciliary motion, favor drainage from the passages, with at least temporary relief and often permanent help.

THE RELATION OF NASAL DISEASE TO HEADACHE.

It can quite definitely be stated that the cause of the headache lies in one of the nasal accessory sinuses.

Ulceration of the mucosa with involvement of the nerves is the principal cause of headache which we find associated with atrophic rhinitis; but reabsorption of toxins from within the sinus is probably partially responsible.

More or less headache is usually associated with chronic sinusitis. Its severity may bear no relation to the severity of the nasal lesion, very severe pain often being found with minor nasal changes, and vice versa.

SUMMARY.

The pains from nasal affections may be of the most varied kinds.

Facial neuralgia and migraine are often due to disease within the nasal accessory sinuses.

Headache in the supraorbital region with superficial tenderness over the painful areas is usually due to pressure from hypertrophy of the middle turbinate.

Headache is one of the most common symptoms of sinus disease. When due to the maxillary sinus there is a full, tense feeling over the superior maxillary region of the affected side or pain pressing upwards to the outer angle of the eye.

Headache in acute frontal sinusitis is present from the very beginning of the disease, first over the affected sinus, later in the vertex, temporal or occipital regions.

In anterior ethmoid diseases there is pain between the eyes; when behind the eyes and nose there may be trouble with the posterior ethmoid cells.

The headache in sphenoidal disease is most excruciating within the head and through the temples or occipital regions.

419 Boylston St.

DISCUSSION.

A. A. EIKENBERRY. I appreciate this paper very much; I have learned by experience the truth of many things that he has brought out and I am glad to have them presented grouped together in one paper.

I. O. DENMAN. It is a matter of astonishment how few general practitioners ever think of attributing headaches to nasal conditions, and yet we know that they are responsible for a large percentage of

the headaches met with in practice. The general practitioner, and also the public to a certain extent, have learned something about refractive errors and their importance as a source of other troubles, and about the only thing they think of as a source of headache is eyestrain; they have not yet been educated up to the point where nasal malformations are deemed capable of making general trouble.

In my own work I have many cases referred to me to have glasses fitted for the relief of headache which on examination I find need no glasses at all, the headaches being due to nasal conditions. There is a good field here for missionary work; some of the most severe and intractable headaches we have are due to nasal reflexes.

E. JONES. I thank Dr. Denman for emphasizing that fact; like him I have many cases sent to me that have been carefully refracted and find nothing at all the matter with the eyes; the real trouble is in the nose or accessory sinuses.

Atrophic rhinitis has been treated,—by Wood, with Scarlet Red ointment thinned down to 5 per cent. with petrolatum and applied after removing all crusts with hydrogen peroxid.—*Critic and Guide*.

Leucoma corneæ traumatica following severe burns by “slacked” lime has been cleared up wonderfully with Scarlet Red ointment locally.

Dimazon (as ointment, powder or oil) is a *non-staining, non-irritating* substitute for Scarlet Red. Its ointment is a draining, non-adherent dressing, if changed every twenty-four hours, which has the property of stimulating epithelialization similar to that of Scarlet Red. Both are handled by the Heilkraft Medical Co., of Boston.

LAC CANINUM

A CONSIDERATION OF ITS NOSE, THROAT AND EAR INDICATIONS, TAKEN
FROM THE ADOLPHUS VON LIPPE MANUSCRIPTS.

The following symptoms which are detailed seriatim, as far as the above upper respiratory fields are concerned, may be of great interest to the specialist as well as general practitioner.

(1) Tongue very red and coated white. (2) Taste in mouth as if she had been eating spoiled meat. This was much increased by eating any sweet food; lasted all the morning. (3) Increase in the quantity of saliva, which is slightly viscid. (4) Some redness of the left side of the throat but no sensation of soreness. (5) Pain in the right ear lasting only a few moments. (6) Raw sensation in the chest as if it had been scraped.

Third day. (7) Tongue very red and coated white. (8) Putrid taste in mouth. (9) Aversion to anything sweet. (10) Redness of the throat increased. (11) Pain in the right ear for a short time. (12) Considerable expectoration of slightly viscid mucus.

Fourth day. (13) No taste in the mouth. (14) Tongue clean. (15) Frothy mucus in the mouth, increased by going into the open air, and after eating. (16) Slight pain in the right ear. (17) Redness of the throat increased, with slight sensation of soreness on the right side. (18) Catarrh of both nostrils.

Fifth day. (19) Tongue coated white. (20) Catarrh. Sensation of fulness in the upper part of the nose. (21) Constant discharge of thin watery fluid, which slightly excoriated the edges of the nostrils. (22) Throat slightly sore on the right side. (23) Constant inclination to swallow. (24) Throat feels raw. (25) Voice sound changed; is very rough. (26) Mucus in mouth, increased after eating, and also in the air. (27) Considerable sneezing.

Sixth day. (28) Waked up just before daylight feeling almost suffocated. Had to go to the open window. (29) Oppressed for breath all day; only comfortable while in the open air. (30) Throat better. (31) Mouth constantly full of saliva, but lips dry and parched.

Seventh day. (32) Slight coating of the tongue. (33) Throat sore in the afternoon and evening on the right side, with constant inclination to swallow. (34) Frequent inclination to cough from a tickling sensation in the upper anterior part of the larynx—worse while in the house and while talking.

The potency used was the 32nd centesimal.

DONALD MACFARLAN.

DR. MAYO'S TRIBUTE TO HAHNEMANN

Every homœopathic physician who attended the second evening session of Congress must have been greatly impressed with the opening remarks of President Charles Mayo when, in introducing one of the speakers, he used in substance these words: "Much of the progress made in medicine and surgery has been due to the men of vision. Samuel Hahnemann was a man of vision; the only trouble with him was that he had his vision eighty years ahead of his time. He was not understood. What he said about the action of drugs upon the healthy and their curative power for the sick is a proven fact about serums and vaccines." "It was so true," he said, "that it was almost uncanny."

Then Dr. Mayo called attention to the serum made from human gastric ulcers and diseased gall-bladder tissues, remarking upon the selective affinity which these serums seemed to have for the stomach and gall-bladder of the guinea-pigs when administered to them, producing in the pigs conditions exactly similar to those found in the human subject from which the serums were made; and later when a vaccine was made from these same guinea-pigs it tended in turn when so administered to cure infections of the gall-bladder in the human subject.

It was a remarkable admission coming from a man so prominent in old school ranks and delivered before an audience composed of the picked men of the American medical profession.

Can the day be far distant in which the whole truth of the Law of Similars will be recognized?

D. M.

ABSTRACTS

Foreign Bodies in the Trachea, Bronchi and Œsophagus.—Moorhead (L. I. M. J., Oct.) is satisfied that foreign bodies find their way into the respiratory tract or lodge in the Œsophagus much more frequently than is generally supposed. The history, especially in children, is very important and often very difficult to obtain. In one case the child was seen by four physicians and a tuberculosis clinic for relief of a cough, which later was found to be dependent on a foreign body in the left bronchus.

The symptoms of foreign body in the respiratory tract are principally cough and dyspnea; the cough is paroxysmal, may or may not be severe, and the dyspnea is worse after the spells of coughing. In the Œsophagus the cardinal symptom is difficulty in swallowing—of all grades—and there may be dyspnea from tracheal pressure. Pain is often complained of, but seldom definitely located, and there may be elevation of temperature, if inflammation has been started up. If in the bronchus, physical signs give evidence of diminished respiration with inflammation in the area supplied by the occluded bronchus.

A radiograph should be taken in all suspected cases. (Cork hardly casts sufficient shadow to be recognized—unless with the latest technique.—J. L. M.)

Removal is best accomplished and with a minimum danger with the bronchoscope or Œsophagoscope—through the mouth, etc. ("upper" tracheobronchoscopy) or through a tracheotomy wound ("lower" ditto); the latter may be said to have become obsolete, seldom indicated.

In adults ether is usually preferable; local anæsthesia may be used. "No anæsthesia of any kind should be used in children under ten years of age. Moorhead is "satisfied they can be done with far less risk and with as much ease without any anæsthetic."

With local anæsthesia the patient may sit up, but in general anæsthesia should lie flat on the back "with the head held, not hanging, beyond the edge of the table."

Once the presence of a foreign body has been positively determined there can be *no* contra-indication for intervention. Serious or-

ganic disease is the only contra-indication in exploratory operations. The dangers of bronchoscopy and œsophagy are slight. The chief danger lies in continuing any one sitting too long; if not successful in 40 or 46 minutes allow the patient 24 or 36 hours to recuperate. "Killian reported one case in which ten sittings were required to remove a foreign body from the bronchus."—J. L. M.

Bacterial Vaccines in Ear, Nose and Throat Infections.—Crane (*L. I. M. J.*, Oct.) considers these an asset which he could ill afford to do without, but the practitioner should enlist the services of a competent bacteriologist. Failures are due, he believes, to faulty technique in securing a culture and making the vaccine or to our inability to secure a cultural representative of the infection.

The cultures and strain are constantly changing (if this were not true a stock vaccine would do), hence we must have repeated cultures in order to meet the progress of the infection. It is essential to secure the causative bacterium, rather than the contaminating bacteria. "The time between taking the culture and placing it in the incubator should be short. Pocket incubation is not recommended." An autogenous vaccine can be prepared in 30 to 40 hours.

In acute infections secure the culture as early as possible with a platinum loop and care to avoid contamination. "The cotton swab is mentioned only to be condemned." "A culture taken when the membrana tympani is incised will give us a vaccine much more potential than one taken twenty-four hours later."

Stock vaccine is ruled out as a specific therapeutic measure because of the practical impossibility of taking a culture, diagnosing the bacteria present (and their changes) and, then, of selecting a stock vaccine which contains the same species and strain as your culture.

"Our first culture may not represent all the infection, but repeated cultures and more careful technique—such as the use of plate culture, the planting in the first instance of a number of fields of different media—will obviate this in most instances."

The staphylococcus growth often obscures the streptococcus. The bacillus mucosus capsulatus and the micrococcus catarrhalis may often grow so profusely that no other bacteria can be isolated; but a second culture taken will often have little or none of these.

ABSTRACTS.

Intelligent use of stock vaccine requires a culture for diagnosis and at least half as much time as would be needed to prepare a vaccine.

The teeth are so frequently the seat of primary infection that their examination should be part of the routine in every case.

(Until seen by the dentist, much good may be done by thorough applications of iodine in glycerine—8 or even 30 grains to the ounce. This has stopped toothache and—by swabbing the pockets—even cured pyorrhea alveolaris.)—J. L. M.

REVIEWS

THE NOSE, THROAT AND EAR: THEIR FUNCTIONS AND DISEASE. By Ben Clark Gile, M. D. The book contains 456 pages with 131 illustrations, eight of which are printed in colors. Philadelphia: P. Blakiston's Son & Co. Price, \$2.75.

This is the first edition, and judging by the originality of the author and his way of putting things it will be likely to be popular with the student. There are some things which the author does not attempt to go into fully, for instance, the labyrinth; but in these instances he refers the reader to other more elaborate works on the subject.—ED.

THE DEAF, THEIR POSITION IN SOCIETY AND THE PROVISIONS FOR THEIR EDUCATION IN THE UNITED STATES. By Harry Best. Library of Economics and Politics. Thomas Y. Crowell & Co. New York. Price, \$2.00.

"This scientific study of the deaf in America constitutes an unusually important contribution to the literature of the subject."

"The author approaches the subject from the attitude of the social economist."

The two divisions of the book are devoted, respectively, to a discussion of the deaf in society and to the provision made for their education. Since every physician is a conservationist he naturally becomes a social economist. As a social economist he cannot well afford to ignore works of the kind written by Best. The motive for writing the book is clearly set forth when the author dedicates it "To the deaf of the land and to those who love them." As physicians interested in the etiology and diagnosis of disease from the scientific standpoint we too often appear to view things in a cold-blooded manner. This is often more apparent than real. As physicians we owe to the child, the family, and society at large to see to it that our efforts do not cease the moment we have established the diagnosis of deafness. We should go farther and see to it that their parents are properly informed; instruct them as to what is best to be done for the child and aid them in whatever way possible to secure for the child

REVIEWS.

a capable private tutor at home, or, in the event that the family cannot afford this, see that the child is put in the best available institution for future training. It is encouraging to note the zeal with which the social economists are coming to the aid of the physician in helping to look after defectives.

This work of Harry Best should find its way into the office of the general physician as well as that of the otologist.—ED.

SOCIETIES

JOINT REPORT OF COMMITTEES

OF THE AMERICAN OPHTHALMOLOGICAL SOCIETY, THE SECTION ON
OPHTHALMOLOGY OF THE AMERICAN MEDICAL ASSOCIATION, AND
THE ACADEMY OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY.*

REGARDING THE ESTABLISHMENT OF A JOINT BOARD TO ARRANGE, CON-
TROL AND SUPERVISE EXAMINATIONS TO TEST PREPARATION
FOR OPHTHALMIC PRACTICE.

DURING the past year the American Ophthalmological Society, the Section on Ophthalmology of the American Medical Association, and the American Academy of Ophthalmology and Oto-Laryngology have considered and adopted the reports of their respective committees recommending that graduate courses in ophthalmology representing at least two years of work subsequent to taking the degree of Doctor of Medicine be established in medical schools of the first class; and that such work be recognized by conferring an appropriate degree upon those who have successfully completed it.

It seems clear that there is unanimous agreement as to the need for systematized and standardized training of those who are to practice ophthalmology. At least five of the medical departments of important American Universities have now arranged for such courses leading up to special degrees. But already it is clear that the number of graduate students who will take the complete course leading to such a degree will, in the near future, be small. Even in universities capable of furnishing facilities adequate for the training of large numbers, the great majority will not meet the requirements for the higher degree.

It is desirable that the standard of attainment for which university degrees are given should be kept fully up to the present standard of our best universities. As matters now stand, therefore, a large majority of those entering upon the practice of ophthalmology will not be reached, or directly influenced, by these standards. It is ex-

*Read at the Annual Meeting of the O., O. and L. Soc., June, 1915. Received too late to be included in Transactions, published in November Journal.

SOCIETIES.

tremely desirable that all who take up ophthalmic practice as a specialty should be induced to pursue systematic courses and to show proficiency therein.

Professional opinion, particularly the opinion of those who have already established themselves in ophthalmic practice, can bring about the desired change to a large extent, without assistance from legal enactments and without the necessity for establishing new educational institutions. It is only necessary to bring into existence a competent body to outline the proper course of study to be pursued; to examine and pass judgment upon existing institutions that offer opportunities for such study, and when individual students have proved that they have profited from such opportunities, and have prepared for ophthalmic practice, to give them the advantages of a certificate to that effect.

To accomplish this purpose, in which we believe the ophthalmologists of America are fully united, we make the following recommendations, unanimously agreed to by the joint committees representing the three organizations above named:

1. That by the conjoint action of the American Ophthalmological Society, the Section on Ophthalmology of the American Medical Association, and the American Academy of Ophthalmology and Otolaryngology, a Board be established to arrange, control, and supervise examinations, to test the preparation of those who design to enter upon the special or exclusive practice of ophthalmology.

2. That this Board consist of nine members; three to be chosen by each of the above named organizations, in the same manner as their presiding officers are named. At the first election each organization shall choose three members, one for three years, one for two years, and one for one year; and thereafter one each year to serve for a term of three years. Vacancies shall be filled for the unexpired term by the Society from which the preceding member has been chosen. No member of the Board shall serve more than six years continuously.

3. Members of the Board shall serve without compensation, but shall be reimbursed for actual expenses while engaged in the work of the board, provided all other necessary expenses of the Board and its appointees have been properly provided for.

4. The Board shall appoint from its own membership, and from the medical profession outside its membership, a sufficient number of

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learned and skilled examiners who shall conduct the said examinations and report thereon to the Board.

5. The examinations may be held in any city of the United States where good facilities may be obtained for conducting clinical and practical examinations.

6. The Board shall fix requirements to be met by all candidates for examination, which shall include the successful completion of a course in medicine in a medical school of recognized good standing, at least two years before the examination; adequate study of ophthalmology and allied subjects; and payment of an examination fee to be fixed by the Board. It shall be authorized to prepare lists of medical schools, hospitals and private instructors recognized as competent to give the required instruction in ophthalmology.

7. Each candidate whom the examiners report as having successfully passed the required examination shall receive by the authority of the Board a certificate or diploma, setting forth this fact, but conferring on the recipient no academic degree.

8. The American Ophthalmological Society and the American Academy of Ophthalmology and Oto-Laryngology shall from the year 1920 require every candidate for membership in those bodies to possess the certificate above mentioned, unless the applicant shall possess a degree in ophthalmology conferred by a university recognized by them as competent to prepare its students for such a degree. The Section on Ophthalmology of the American Medical Association, in so far as it is empowered to adopt its own rules, shall from the year 1920, require that its officers and those members accorded places on its program shall possess the certificate in question or its equivalent; and shall request that in the directory published by the Association, the holders of such certificates be especially recognized.

GEO. E. DE SCHWEINITZ, Phila.	WALTER R. PARKER, Detroit.
MYLES STANDISH, Boston.	ALEXANDER DUANE, New York.
SAMUEL D. RISLEY, Philadelphia.	WM. ZENTMAYER, Philadelphia.
JOHN E. WEEKS, New York.	WENDELL REBER, Philadelphia.
WILLIAM H. WILDER, Chicago.	WALTER B. LANCASTER, Boston.
HIRAM WOODS, Baltimore.	EDWARD JACKSON, Denver.

CORRESPONDENCE

A LETTER TO THE SUBSCRIBERS

The Business Manager, Dr. J. R. McCleary, upon the advice of the Journal Committee—composed of six of the active supporters of the Journal, has decided to raise the price of the subscription from \$2.00 to \$3.00, for the following reasons:

(1) That the Journal at present contains twice the amount of reading matter it did when it was selling for \$2.00.

(2) That the number of illustrations has been more than tripled—and illustrations are more costly than straight reading-matter.

(3) That after a canvass of the subscribers the replies indicate that they feel the Journal at present is worth at least \$3.00, if not considerably more.

I take this opportunity to thank our subscribers for their kindly interest in the welfare of the Journal and invite their further co-operation for the coming year.

With the compliments of the season, I am,

Sincerely yours,

G. W. MACKENZIE.

NEWS AND NOTES

Dr. J. Hubley Schall has been selected, without a dissenting vote, Chief of the Surgical Staff of the New Municipal Hospital of Brooklyn.

We are pleased to note that Dr. Schall's ability has been officially recognized in this recent appointment. We are proud to add that he is a surgeon who was *made in America*. His diagnostic and operative ability has been recognized for a long time by his friends and they wish to congratulate him on his appointment, the more because it was unsought—and also the appointive powers upon their wisdom in their selection.

The death of Mrs. Constantine Hering, the widow of Constantine Hering, at the advanced age of ninety-three years recalls not only the life of good deeds of a good woman but also the association of a generation long past. In that generation was seen the struggle of an infant school of medicine and the victory of a few stalwart souls over a storm of antagonism and prejudice.

Mrs. Hering is survived by a family of conspicuously prominent sons and daughters who, largely through inheritance from good parents, and also through industry and honesty, have kept alive the family name.

The Noble prize for medicine for 1914, of the value of about \$40,000, has been awarded to Dr. Robert Barany, privat-docent in otology in the University of Vienna, for his work on the physiology and pathology of the vestibule of the ear. The prize for medicine for 1915 is reserved until next year.

Since the fall of Przemyśl, Dr. Barany has been a prisoner of war at Merw, in the Trans-Caspian district of Russia.—*The Laryngoscope*, Dec., 1915.

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Editorial

RELATION OF EYE-DISEASES TO GENERAL MEDICINE.

PROGRESS in the knowledge of our art not seldom shows a strong revolutionary character, and with the false and erroneous often much truth and good is thrown aside. This condition occurs in the changing opinions concerning the relation of eye-diseases to general medicine.

Bier, in 1813, wrote in the introduction of his work, "Die Lehre von der Augenkrankheiten," in the second paragraph,—“Everything which influences anything as a whole, influences also a part; also everything which influences a part must create an influence on the whole. Therefore, everything which affects the organism of an individual can never exclude its influences upon the eyes—the converse of which also is true.”

This broad teaching had a wonderful influence during the greater part of the last century. As a result, all eye-diseases were looked upon as an expression of a constitutional derangement. Jüngken, for instance, in his "Lehrbuch" (1842), 3d edition, classifies eye-diseases as ophthalmia catarrhalis, scrophulosa, rheumatica, arthritica, syphilitica, scorbutica, cachectica, herpetica, psorica, hemorrhoidalis, menstrualis, catarrhalis rheumatica, abdominalis rheumatica, etc.

The modern school of ophthalmologists often has had occasion to criticise (and not without cause) former superfluous and unnatural schemas; unfortunately the little grain of truth which existed in these schemas is liable to be forgotten by many of us to-day. Many of us, perhaps, get interested in that part of our work which constitutes the greater portion of our daily routine; namely, refraction; and unconsciously we consider the eye as a thing by itself. Alas! In order

to get the true spirit of the relationship of eye-diseases to neurology and general medicine one must go to Europe, where the Augenartz is, above all, a well-trained internist and neurologist. To hear men of the calibre of Uhthoff and Strümpell hold weekly conferences over their clinical material covering this subject or to attend Marburg's clinic at Vienna, where special attention is given to our subject, is an inspiration one never forgets. One of the reasons for a broader knowledge of this subject may be that in Europe there are more transitional cases for clinical study. This is especially true of diseases such as multiple sclerosis and tetany, two conditions which are seldom met with in America.

Since American literature covering the subject of the relation of the eye to modern neurology is not over-abundant, I take this opportunity to have a portion of this month's journal devoted to the subject.

FRANK O. NAGLE.

THE PAINE OPERATION FOR EXTRACTION OF A COMPLETELY DISLOCATED LENS FROM THE VITREOUS.

The profession—the world—is indebted to Dr. Howard S. Paine, of Glens Falls, N. Y., for a new method of saving eyes which would otherwise be doomed to irremediable blindness.

"Peace has its heroes as well as war." It required no little courage to first make this operation directly against the dictum of all the authorities, European and American.

The fundamental point in Dr. Paine's operation is to *all the time see the lens*; see what you are about.

He usually instils atropin twenty-four hours beforehand, gives 10 grains of veronal and a hypodermic of morphine half an hour prior to operation and, of course, cocain and adrenalin locally.

A 20-candle frosted hand-bulb (spiral filament) is held about one-and-a-half or two feet above and to the left (?) of the eye, and the light condensed into the latter with a three-inch hand-lens (a hand illuminator might answer), the operator's eyes being protected with a broad eye-shade. The light should not be so bright as to make the patient wince and fight it. A good assistant is necessary to ensure that there shall be no pressure upon the eyeball by speculum or lids. The

incision should be made very slowly and carefully, as the vitreous in cases of long standing is apt to be fluid or there may be hypertension and a hemorrhagic tendency. Make the incision well back in the sclera, not only from fear of glaucomatous tendency but also to facilitate the iridectomy should the iris have a funnel depression. A long conjunctival bridge keeps the wound from gaping while you change position or instruments; a stitch is inserted at each end and the bridge is cut between the threads.

The operator is seated so that he can look down into the eye from above, all diffuse light excluded. It may take a little time to make out the lens distinctly, but that can be done also by assistant and nurse, even when the lens is of crystal clearness; to distinguish the latter it may be necessary at times to shift the angle of light a little.

With the lens constantly in view it is gently raised to the incision (if possible so far) with a minute sharp hook (Steven's or Tyrrell's (or a Knapp's loop and, the condenser being handed to an assistant, a Smith spatula is carefully passed behind the lens, which, thus supported, is delivered by pressure with a blunt hook on the lower part of the cornea.

Dr. Paine reports (*Annals of Ophthalmology*, July, 1915) six cases, of which four occurred in two sisters. In Case III the lens had spontaneously slipped into the anterior chamber, and the first case was not operated. Cases I and VI were traumatic, the others spontaneous. Cases I, II, V and VI were partly dislocated, hinged; in Case IV the fully luxated lens had settled at the lowest part of the very fluid vitreous, shifting in accordance with the position of the eyeball.

Case II, hinged downward and backward, did *not* "float into the pupil" but was lifted out with a Knapp loop; case III of course with the loop. In Case V the hinged lens floated well into the pupillary space upon completion of the incision, but in Case VI it hung far down in the eye, almost entirely below the lower margin of the pupil, requiring the spatula and external pressure for its removal. This patient was very nervous and unruly—the speculum was replaced with a Fisher lid elevator—but recovered nicely without any complications. Later some retinal detachment was observed where the lens had been hanging for about a couple of months; the question arose whether this was

due to the trauma (a piece of thrown candy) or by the pressure through the sclera against the spatula? Dr. Paine has decided never again to pass a spatula or loop so deep into the eye, but to lift the lens as far as possible, then place the spatula behind it and use external pressure on the cornea, not again on the sclera.

The doctor's visual results, in the four cases where any vision was possible, were very gratifying—perfect in three of them.

Another lesson from Dr. Paine's experience is—*operate early*,—despite the old authorities.

Fortunately, dislocated lenses are rare; but it would be wise to have a suitable means of illumination always in readiness and a long temple-curved speculum in case no reliable assistant can be depended on to keep the lids open with the Smith or, better, Fisher lid-hook.

At last we need no longer tell the patient with a "lost" lens that operation for its recovery is "impossible."

J. L. M.

POST-GRADUATE WORK IN AMERICA.

The most important question that comes to the prospective post-graduate student is where to go to get the best instruction in the shortest time and at the most reasonable cost. It is a question of the post-graduate school or the private teacher.

At the present time many of the post-graduate schools are in disfavor with those students who have had experience with them. There is little individual attention given in the short clinic hours, and the so-called "assisting at the operation" is largely a chimera so far as the student is concerned. The student himself will best describe the average course given: "We just stand around, look on and try to take things in." The excuse of denying students practical operative work because they are "green" will hardly satisfy the man who is paying to learn. What he wants most is just such work, and this he seldom gets. The classes, even though small, are unwieldy, and often the best the professor-in-charge can do is to let the student look on. If he invites a man to operate with his assistance—well and good for that particular man; but the teaching hour will drag for all the others. Individual attention is undoubtedly the best in post-graduate schools,

as elsewhere, but I have never witnessed it in any of these schools nor have I seen it mentioned in their catalogues.

Private teaching has to recommend it individual attention and a personal interest in the student's progress. Its directness cuts down the factor of time consumed in getting what he wants and what he needs. Occasionally the practical work is limited and therefore variety is not obtained, but this happens only when the teacher has no connection with clinics (rare nowadays). The question of the fitness of the teacher will naturally apply equally to the teacher in the graduate school and to the private teacher.

Too emphatic advice cannot be given prospective students too look around thoroughly before choosing their course. In deciding hastily they are very likely to meet with disappointment. Most of the schools are anxious to have a student sign up and pay his tuition at the beginning of the course, or even before starting. This means they foresee dissatisfaction. The student needs most of all, and should demand from either school or private teacher, individual attention and practical work. In the selection of a private teacher ability to teach and the reputation of the man should determine the student's choice—and often a fortunate combination of these can be found.

The prospective post-graduate student cannot do better than read the issue of this JOURNAL for January, 1913, in which is the report of the Committee on Special Education—Burton Haseltine, Chairman. Dr. Haseltine and his committee have emphasized the necessity of a graded course, with the idea of getting at the subject "from the bottom up." Any teacher who has seen the conglomerate mixture of advanced and backward students that attend their clinics can understand the impossibility of adequate class-teaching unless the fundamentals are well understood by all. It would be a great waste of time for a man well-read at least in his subject to attend these general clinics. He would need more special and particular attention. The general nose and throat clinic, that is, the clinic devoted to teaching a mixed class of students by a hap-hazard case-demonstration method, would be acceptable only to the class that this committee describes as men who go to get a superficial training so that they can attend with a little more understanding to the diseases that come to one in ordinary general practice.

Concerning the essential graded course as a fundamental: "The New York Ophthalmic is the only institution having an organized course covering the field of Ophthalmology, Otology and Laryngology as they should be covered. The plan of this college comes nearer, we believe, to meeting the demands of modern instruction in these specialties than perhaps any other in the world."—DOUGLAS MACFARLAN.

THE PROGRAM OF THE O., O. AND L. SOCIETY.

The program of the O., O. and L. Society meeting to be held this year should meet with the approval of every one of its members. President Phillips has arranged with Dr. G. De Wayne Hallett, of the New York contingent, to hold a two days' clinical session in New York, on June 23d and 24th, next after which there will be a two days' session, June 26th and 27th, in Baltimore for the presentation of papers.

In a communication received by President Phillips from Dr. Hallett it is stated that the New York men have accepted the idea of a clinical session enthusiastically, and among other actions taken at the meeting of the New York members of the society, elected the following committees:

General Committee of Arrangements, Dr. A. B. Norton, chairman, 30 East 55th Street; Dr. DeWayne Hallett, Secretary, 274 West 86th Street.

Committee on Hotel Headquarters, Dr. L. E. Hetrick, 4 West 93d Street.

Committee on Ophthalmic Hospital Clinics, Dr. G. A. Shepard, 55th Street and 7th Avenue.

Committee on Flower Hospital Clinics, Dr. R. S. Copeland, 58 Central Park West, with Dr. G. McDowell, 40 East 41st Street.

Committee on Metropolitan Hospital Clinics, Dr. C. A. Boyle, 40 East 41st Street, with Dr. H. A. Foster, 55th Street and 7th Avenue.

Border-Line Dermatology, Dr. F. M. Dearborn, 55th St. and 7th Avenue.

Border-Line Neurology, Dr. J. E. Wilson, 616 Madison Avenue.

Border-Line Roentgenology, Dr. W. H. Dieffenbach, 256 West 57th Street,

The meeting in Baltimore will be held at the same time as the A. I. H. meets there, and Dr. C. L. Rumsey, Chairman of the Committee of Arrangements at Baltimore, is doing everything possible to make this year's convention a successful one.

G. W. M.

DR. CHARLES M. THOMAS.

DR. CHARLES M. THOMAS, former dean of the Hahnemann Medical College of Philadelphia and honorary member of the O., O. and L. Society, died at his country home near West Chester in January, 1916. He was sixty-seven years old. He retired from active practice three years ago.

Dr. Thomas was recognized as one of the leading eye-specialists in the United States and was an authority upon the subject. He was a skilful operator, comparable with the best in Europe. Like many other famous specialists he served an apprenticeship in general surgery before taking up the surgery of his specialty.

Dr. Thomas was born in Watertown, N. Y., May 3, 1849. He was educated in the Central High School and the Hahnemann Medical College of Philadelphia. Later he studied surgery in Europe. He became professor of general surgery in Hahnemann Medical College, where his lectures and clinics were appreciated by all who were fortunate enough to be able to attend them. Eventually, about 1891, he devoted his attention exclusively to the eye, ear, nose and throat specialty and became professor of eye diseases. He was recognized by the profession as a profound student, an able teacher, a brilliant operator and a princely man. He was admired and loved by all who knew him.

He is survived by a widow, three sons and three daughters. Mrs. Thomas was Miss Marion Turnbull, daughter of the late Dr. Laurence Turnbull, of Philadelphia.

THE OCULAR SYMPTOMS OF MULTIPLE SCLEROSIS WITH REPORT OF A CASE.

FRANK O. NAGLE, M. D.

Philadelphia.

THE writing of this paper recalls to me a clinic held by Professor Strümpell before the American Medical Association at Vienna. Professor Strümpell stated that from the knowledge he gathered from American text-books, Multiple Sclerosis is either a rare disease in America or Americans are not conversant with the diagnosis of this fairly common disease in Europe. The older men of the profession know that the latter statement is not the case. My own experience with this disease in the clinics abroad and at home form a marked contrast.

Multiple sclerosis, as a rule, is a cerebro-spinal sclerosis, less frequently a spinal sclerosis, and exceptionally it may affect the brain only. It is a juvenile disease and has a special tendency to occur between the ages of twenty and thirty. It may begin with a weakness of musculature, especially of the legs. The gait may be ataxic or spastic. The tendon reflexes are increased. The Babinski reflex is present. Strümpell's symptom, namely, loss of the abdominal reflexes, is usually present. Especially characteristic is intentional tremor. This appears only during active voluntary movements of the hands, and disappears while at rest. Not only the extremities but also the facial muscles are affected. Intentional tremor is absent in only a few recorded cases.

Multiple sclerosis is a disease of great irregularity, and a classical picture of it is hard to draw. It is not surprising that three types of this disease have been described by writers, according to the symptoms referable to one or other of the parts of the cerebro-spinal axis. The following is a good text-book definition from Wood's "System of Ophthalmic Therapeutics:—" "Multiple sclerosis is a disease of toxic origin, affecting both the spinal cord and brain in varying degrees, and at any or all levels. The sclerotic foci, irregularly and widely disseminated throughout the nervous system, give rise to a great variety

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of symptoms, of which the more common are muscular weakness and spasticity, intentional tremor, scanning speech augmented by special sense changes, anomalous reflexes, bulbar disturbances and psychic phenomena."

Charcot and his pupils first drew attention to the ocular defects associated with multiple sclerosis. Since that time a vast literature has covered the subject with the names of many prominent neurologists and ophthalmologists. Since ocular disturbances are frequently the earliest manifestations, their prompt recognition becomes a factor of importance in the diagnosis of multiple sclerosis of the brain and spinal cord.

Nystagmus is seldom absent. E. Müller found it in 73 per cent. of his cases. Uhthoff, in his one series of one hundred cases of multiple sclerosis, observed typical nystagmus in 12 per cent.; in 46 per cent. of the cases, there were nystagmic twitchings in abduction of the eyes. A unilateral nystagmus is very rare. A localized sclerotic patch in the brain or medulla is held responsible for the symptom of nystagmus.

From a clinical standpoint, these patients are apt to complain of motility of the fixed object, a different point from congenital nystagmus.

Paralysis of eye-muscles is not rare. Paralysis of the individual branches of the same nerve seems to be characteristic; furthermore the paralysis is of transient duration. Uhthoff found ocular paralysis in 17 per cent. of his cases; the abducens six times, oculomotor nerve (single branches) three times; paralysis of convergence three times; ophthalmoplegia externa twice.

Pupillary changes are rare. Uhthoff found the Argyll-Robertson pupil once; Charcot never found it.

The optic nerves are affected more commonly in multiple sclerosis than in tabes; indeed, more often than in any other disease of the nervous system, except cerebral tumor (Uhthoff). The clinical features are those essentially of a retrobulbar neuritis with a central scotoma or without contraction of the visual field.

In the "Klinische Monatsblätter für Augenheilkunde," Sept., 1915, is an article written by Tarle, entitled "Beitrag zur Beziehung zwischen Neuritis Retrobulbaris Acuta und der Multiple Sclerosis." He reiterates what Fleischer concluded from his series of cases from the same

Tübinger clinic in 1908. Excluding auto-intoxication, an acute retrobulbar neuritis in the young points to a great likelihood of an oncoming multiple sclerosis.

Tarle, from a systematic study of 29 cases of recent neuritis retrobulbaris acuta, came to the following conclusions:

Women are much more often affected than men; two-thirds of his cases were in women. This ratio corresponds to those earlier statistics on this subject by Fleischer.

AGE STATISTICS:

7 cases	15-20 years	24.3%
13 "	20-30 "	44%
5 "	30-40 "	17%
5 "	46-50 "	13%

The youngest patient was a 16-year-old girl; the oldest a 46-year-old woman.

Nothing new could be established concerning hereditary influence. Concerning visual disturbances three cases resulted in permanent amaurosis, three cases possessed only light perception, and fifteen cases counted fingers directly in front of the patient.

It is important to keep in mind the duration of this condition. Time-limit in Fleischer's series ranged from several days to four weeks. The vision returns as suddenly as it left. The visual fields return in the same order as they receded.

Concentric contraction of the visual field, ring scotoma or hemianopic fields are rare. Regarding the relative frequency of optic nerve involvement, we must look to Uhthoff for reliable information. In one hundred cases of multiple sclerosis Uhthoff found the optic nerves normal in fifty-five patients. In three cases marked atrophy was present in both optic nerves. In nineteen cases there was a partial pallor of the whole disc; in 18 per cent. a partial atrophic pallor of the temporal side of the disc, in one-third of which number the condition was unilateral. In five cases there was optic neuritis present.

Among the optic nerve affections in multiple sclerosis, choked disc is very rarely encountered; in a great number of cases of this disease in Europe, choked disc has been observed only nine times. As an ocular symptom of multiple sclerosis, it was first reported by Bruns and Stölting. Rosenfeld reported a case with microscopic

findings. He explains the cause of choked disc in his case by the fact that directly behind the papilla a sclerotic patch was present as a characteristic for choked disc of multiple sclerosis. Rosenfeld gives rapid course and disappearance of the choked disc. In all the cases of multiple sclerosis associated with choked disc, it is interesting to note that all the authors first diagnosed the cases as tumor cerebelli.

Visual disturbances may occur without any pathological change being present at the optic disc. In other cases we observe in contradistinction to tabetic atrophy, a congestion of the disc and haziness, which in combination with the visual disturbance are to be regarded as pathological and a precursor of a simple atrophy. I have seen in the same individual in one eye a genuine atrophy, and in the other eye an optic neuritis. In many instances the ocular symptoms precede the general symptoms of this disease. Uhthoff's symptom is frequently present, namely, loss of visual acuity following general fatigue of the body. In contradistinction to tabes we seldom have total permanent blindness. Again, if this latter condition is present a return of vision is more likely to occur. In the majority of cases both optic nerves are affected. The visual disturbance at first depends on the presence of a central scotoma; in other cases a peripheral visual field-contraction. Very seldom do we have a contraction of these two visual fields.

P. Marie gives as a characteristic for visual disturbances in multiple sclerosis, an asymmetrical involvement of both eyes (an important differentiation from retro-bulbar optic neuritis). Gowers in his pathological studies observed that in one eye an earlier and greater involvement is present than in the other.

As far as the pathology of multiple sclerosis is concerned, it is exactly the same process as we find in the brain and spinal cord; namely, a sector degeneration. We have anatomical examinations of the optic nerve from Uhthoff, Lubbert, and Elschnig. It is an altogether peculiar disease of the optic nerve, easily differentiated from tabetic degeneration, interstitial neuritis and neuritis axialis.

The sclerotic patches are seen to best advantage when the specimen is stained with Weigert or Pal's stain. One finds even upon macroscopic examination, in perfectly normal parts of the optic nerve, sclerotic patches in which the medullary nerve sheaths have disappeared. This latter condition is easily discernible microscopically.

The septa are thickened, the finer septa and connecting bands of connective tissue uniting the septal bundles having disappeared. In old cases nuclear proliferation and vascularization are present. A special characteristic is the fact that the axis cylinders remain intact (directly opposite to tabes).

The nuclear proliferation in the septa places the pathological process of multiple sclerosis between that of tabes and inflammatory atrophy.

As to where the process begins, opinions vary. In the writings of Pierre Marie, the cause of this disease was assigned to changes in the vessel-walls. To quote him, "The sclerotic areas are of vascular origin, the resulting picture resembling very much a sclerotic process, due to an infection." Uhthoff describes the vascular changes in the connective-tissue septa.

While I attended the Nervous Clinics during the winter of 1908 at Breslau, and the winter of 1909 at Vienna, Strümpell taught that multiple sclerosis is a congenital affection of the nature of a gliosis, not unlike syringo myelia, and that the nerve fibres become affected secondarily. Yet during the same winter's work at Vienna Redlich taught his students that multiple sclerosis is a parenchymatous disease of the myelin of toxic origin, and that the glial changes are secondary.

The majority of modern neuropathologists consider multiple sclerosis as belonging to the inflammatory processes of the brain. They classify it as a peculiar form of myelitis. Differences of opinion exist concerning only the "Ausgangspunkt" of the process and the "Aufeinanderfolge" of the pathological changes. To this day it is an open question whether the nervous tissue is primarily affected, a so-called parenchymatous myelitis, or whether the affection of the medullary nerve-sheath (at times the axis-cylinders) is a secondary process following an interstitial inflammation.

Strümpell, Müller and Ziegler are firmly convinced that the sclerosis is a result of primary proliferation of the neurologia in combination with endogenous (congenital) causes. According to this theory a genuine multiple sclerosis exists only as a chronic disease. To the contrary, other investigators consider multiple sclerosis as an inflammatory process, and seek its course in exogenous influences

(toxins). This inflammatory theory has been defended many years by Charcot, who calls the entire process myelitis—interstitielle chronique primitive.

From the standpoint of the inflammatory theory the clinical forms of acute multiple sclerosis may be perfectly understood.

On October 1, 1912, I was called in by Drs. Sigmund Rane and Alexander Stetson to report the eye-findings in a patient in whom they suspected multiple sclerosis.

The history of the case was the following:

The patient, aged 20, was in a mining camp out west for some time. His first complaint was failing vision. For a period of three months he was unable to see at all and was confined to bed because of *inability to walk*. The patient was sent east with the diagnosis of brain tumor.

Drs. Rane and Stetson reported the following symptoms being present: Scanning speech, peculiar facial expression, loss of abdominal reflex, increased patellar reflex, Babinski's reflex present. Patient was extremely weak.

The ocular findings were,—Nystagmus on abducting the eyes; paralysis of the individual branches of the 3d nerve.

Fundus examination revealed right eye in a condition of secondary optic atrophy, while an optic neuritis was present in the left eye.

The patient was left in bed at absolute rest for three months, and given massage by Dr. Stetson. At the end of that time patient was able to go about the same as usual and vision in each eye returned to 20/20.

After a lapse of three years the patient feels perfectly well and is actively engaged in business, in spite of the poor prognosis which we offered to his family at the time we arrived at our diagnosis. It will be interesting to learn for how long a period this patient will be free from a second attack. As far as the tentative diagnosis of brain tumor is concerned, it is a difficult problem at times to differentiate cerebral tumor, hysteria and multiple sclerosis.

WHEN IS OPERATION INDICATED IN STRABISMUS? PRESENTATION OF CASES.*

C. W. LEFEVER, M. D.,

Philadelphia, Pa.

TO those engaged in the practice of general medicine there must be a good deal of doubt as to what cases of "Crossed Eyes" or "Cast in the Eye" should be operated upon, and since the family physician is generally called upon first for advice by these patients, some clarification of this field will perhaps be helpful.

Since most of these cases are due to hyperopia, and since hyperopia tends to grow less or entirely disappear in early childhood, it rarely occurs that a squint which has appeared in a young child will disappear without any treatment as the child grows older and becomes emmetropic, or nearly so. This formerly led many general practitioners into the mistake of advising parents not to be alarmed when a young child with squint is presented for advice, because he may "outgrow it." Of course this is a serious mistake because the time when most can be done is just at the time when the parents are being advised to do nothing, and later, when the squint is found to be permanent, there may be little that can be done except in an operative way.

The following hypothetical cases are illustrative. What is indicated in each?

1—Age five years, presents a convergent squint of 45 degrees, three years' standing with no treatment.

2—Age nine years, convergent squint of 45 degrees, has worn glasses three years.

3—Age 12, convergent squint 45 degrees, since infancy, with no treatment.

4—Age 6, glasses for two years, convergent squint, with glasses 20 degrees, without glasses 40 degrees.

*Read before Mt. Sinai Hospital Clinical Association.

WHEN IS OPERATION INDICATED IN STRABISMUS.

5—Age 6, constantly noticeable divergent strabismus with good motility.

6—Age 20, divergent squint following a blow on the head, one year standing. Diplopia. Little if any adducting power.

7—Age 30, convergent squint, one year's duration, following luetic infection which has been under constant treatment during the year, with resumption of motility. No diplopia.

8—Age 25, functional convergent squint 30 degrees, since childhood, with no treatment.

It is probably known to most medical men that not all such cases are proper for operative treatment. Most medical men also know that some cases of squint in children are curable by means of glasses, and they know that paralytic strabismus is not usually treated by surgical measures. On the other hand, many practitioners also know that there are cases of invisible squint—squint which is not manifest on inspection—that are proper cases for surgical treatment. It is perhaps common knowledge among medical men that crossed eyes of long standing can only be cured by means of surgery. Yet with all of these general ideas, which are good, there remains always a doubt as to whether any given case is proper for surgical treatment.

So it is the purpose of this paper to point out the conditions which call for operation and to differentiate such cases from those which do not; or it may be to indicate at what stage in the life of a patient an operation is indicated and at what stage contra-indicated.

Before entering upon this study let us pause for a moment to ask what the operation is for—why correct the squint at all? Three impelling motives demand it.

First, the deformity. This doubtless is, in the mind of most persons concerned, the most important reason why the squint should be corrected. It is not necessary to dwell upon the disadvantages of a squint to a young woman, from a social or a matrimonial point of view; nor to analyze the handicap it places upon a young man in these respects as well as in an economic way.

Second, single binocular vision, or the ability to focus both eyes together on the same point. Man is the only animal which possesses this faculty, and if all adjustments are perfect there is no doubt of its

advantage. It is a great disadvantage, however, when the adjustments of the muscles and dioptric media are very faulty, as they often are.

Man is endowed with a special sense which we call the fusion faculty and which demands single binocular fixation. Any failure to maintain it is at the price of double vision until such a time as the patient can learn to suppress one image. Our version to diplopia is so great that we willingly suffer great strain and discomfort to prevent it; and this suggests the third reason for a cure of the strabismus.

Third, discomfort. This is due, as already suggested, to the effort which is necessary to prevent a latent squint from becoming manifest. It is for this purpose that nature has given us the danger-signal of diplopia which springs into our pathway the instant we fail to place the two minute images on exactly identical points of the two retinas.

Any consideration of the treatment of strabismus necessitates a classification of cases, because different groups of cases require different treatment. For this purpose we may divide all cases of strabismus as follows:

I—MANIFEST STRABISMUS.

This is the ordinary squint usually spoken of as "Crossed Eyes" or "Cast in the Eye." Rarely it may be a vertical squint with one eye turned up or down.

Manifest Strabismus is subdivided into two groups:

Group A—*Functional*—Includes those cases in which the relation of the visual axes has been lost, but in which the rotations are still maintained and the squint is equal in all parts of the field. The squint may be convergent, divergent or vertical. (In long standing cases, where the squint is limited to one eye, the rotation of that eye may become more or less limited, but in childhood the rotations are generally normal.)

Group B—*Organic*—Includes only paralytic cases. In these, of course, one or more muscles being crippled, the rotations into their fields of action are limited, and the squint grows greater as the patient looks in that direction.

II—LATENT STRABISMUS.

This second main group includes those cases in which the squint is kept under control by the fusion sense acting through the co-

WHEN IS OPERATION INDICATED IN STRABISMUS.

ordination centre, and are not seen on inspection but which become manifest when the fusion sense is eliminated, as by covering one eye or by dissimulating the image on one retina so that the patient is not conscious that both eyes are fixing the same object.

Beginning with the first class, viz., manifest functional squint-convergent type, we must consider the age of the patient, the amount of squint, the error of refraction and the history as to glasses. If the patient is very young (not over 7 or 8) and other methods of treatment have not been made use of, no operation should be done until the refraction has been studied, and any error of significance corrected. It must be remembered that the common squint of childhood is convergent, and that in the great majority of cases it is due to the presence of hyperopia; hence the rational treatment is the correction of the error of refraction, which means the removal of the cause.

The action of glasses in the cure of squint is not sudden, and they must be worn at least one or two years before their influence on the squint can be determined. Not that the influence of the glasses is complete in this length of time, for they continue their curative effect until the patient is well advanced into adult life, but if the squint is to be cured in the sense of securing single binocular vision, with both eyes focusing together, it must be done while the child is young, and we cannot wait many years for the glasses to bring about such a result for if single binocular vision is to be secured at all it must be done during childhood. But if great improvement has been produced by the glasses during the first year or two and the squint is much less under the correction than without it, then the glasses are having the proper effect, and it is generally advisable to defer operation if the child is still quite young.

So that it may be laid down as a rule that young children with "Crossed Eyes" who have never been glassed, or who have not worn their glasses constantly, should not be operated upon until the glasses have been worn at least one or two years.

If the child is already wearing glasses and has been wearing them for a number of years and the squint is still very high, then operation is usually indicated as an aid to the glasses and the earlier in life it is done the better.

If the child is past seven years of age and has a very high squint—

say 45 degrees—and has never been glassed, it is not likely that the cure will ever be brought about by means of glasses alone. Operative measures are then indicated at once as an aid to the glasses, and valuable time is lost by deferring the operation because, as already stated, if the child is ever to use the eyes together he must begin to do so soon, for the fusion function cannot be established except during childhood. In adults the eyes may be made apparently straight but the patient never acquires ability to use them together.

There are cases in which the squint is not very high, between the ages of seven and fifteen, in which no operation should be done until the glasses have been worn. In fact it should be a general rule that if the squint is not more than 30 degrees and the patient not over 15 years of age, no operation should be done until the glasses have been well tried.

The older the patient the less influence glasses will have in curing the squint, and if the latter is of very high degree it must not be expected that glasses will bring about a cure except in very young patients. However, glasses are always helpful, and if the major part of the squint is removed by advancing the diverging muscles the glasses may complete the cure. The operation must be considered in the nature of an aid, and in fact this is all it is at any time. No pair of eyes was ever made exactly straight by operation. The operation only removes the chief difficulties or increases the ability of Nature to help herself. The exactness with which the visual axes must be adjusted so that images no more than $1/1200$ of an inch in diameter will occupy exactly similar positions on the two retinas and not produce diplopia, renders it beyond human possibility to accomplish any such result by shortening or lengthening of muscles. The final adjustment must be made by Nature and anything that is accomplished by an operation on the muscles is only an aid.

After puberty, eyes which have been crossed since childhood are never straightened by means of glasses alone and such cases are always proper for operation, except, perhaps, after the patient has passed middle life.

Summing up this group of cases, we would conclude that no case should be operated upon under the seventh year until glassed for one or more years, but operation may be advisable at this early

age if glasses are not found to be producing a cure. Between the ages of seven and fifteen operation is generally indicated whether glasses have been worn or not, but if the squint is not more than 30 degrees glasses should be tried first. Any higher squints should be operated at once to enable the glasses to better exert their influence. Within this period operation is also indicated if glasses have already been worn and the squint remains uncured, even though of low degree.

Finally, after puberty it is useless to waste time with glasses and operation is indicated at once.

As to the divergent type of functional strabismus, there is little to be said in favor of any method of treatment except operation. Myopia has a decided influence in producing this type of squint, as has very unequal errors of refraction in the two eyes, and while the correction of these are helpful in recovering parallelism of the optic axes, divergent squint is never cured by the wearing of glasses, no matter what the type of error. Hence, these cases are always operative, regardless of the age, except, perhaps, in those patients who have passed the time in life where the correction of the squint is of any special advantage. These squints develop in childhood or early adult life, and if the patient has lived more than half of his life, carrying the squint with him, its correction has become unimportant in view of the fact that he is not apt to enter new circles of acquaintances nor to enter upon new business enterprises where the appearance of his eyes would be any disadvantage to him. In all younger patients, however, it is very important that the squint should be corrected, so far as appearance is concerned, and the earlier in life it is undertaken the easier of accomplishment. Like the convergent type, if the patient is ever to secure binocular single vision it must be done while he is quite young, certainly not after puberty, for when the fusion faculty has been in abeyance for so many years it is not possible for it to resume its function.

Unlike the convergent type, this form of squint tends to grow higher as the patient grows older, at least until he reaches middle life; and since all low-degree squints are easier of correction than those of high degree, they should be operated upon as early as possible in the patient's life.

As to vertical squints, the same may be said of them. There

is no method of treatment which has any value in curing the squint except operative measures. Indeed, these two types of squint, lateral functional and vertical functional, are usually associated; that is, the eye seldom turns directly up or directly down, and divergence is much more common as an associated condition than convergence because the position of tonic rest for the eye is up and out; and an eye that is not in use, whether from poor vision (compared to good vision in the other eye) or to other causes, is apt to turn up and out. Unless the vertical deviation predominates, it is customary to direct the operation toward the correction of the lateral squint, which often corrects the vertical position as well, but when the vertical deviation predominates the operation must be done on one or more of the vertical muscles.

So, then, we may say that given a divergent or a vertical squint, operation is always indicated except late in life.

Going now to the second main group of cases—Organic or Paralytic—operation is always contra-indicated as an early measure, and it is also contra-indicated at all times if the muscle has failed to recover a good measure of activity. If the function of the muscle is well recovered, so far as its ability to move the eye is concerned, and the etiological factor which produced the palsy has been removed, and if the patient has not passed well into the last half of a normal lifetime, operation may be done with as good success as it is in functional squint, and is therefore indicated. In reality these squints have now become functional because the patient no longer has diplopia, and his rotations, if limited at all, are not markedly so. The direction of the squint in these cases is not important. Operation is equally indicated whether the squint is convergent, divergent, or vertical.

We have still to consider the second main class of cases, viz: Latent Strabismus. With this class of cases the family physician does not so readily make acquaintance. He sees the patient, to be sure, for this is the one class in which the patient suffers real discomfort from the faulty adjustment of his ocular muscles. The squint is not visible on inspection and the symptoms are often not referred to the eyes. The patient is more apt to seek the advice of a physician for relief from migraine, temporal or occipital headaches, nausea, ver-

tigo or any one of a large group of functional nervous symptoms which the imbalance of the ocular muscles has produced.

The fusion sense is very active in these patients and has saved them from a squint at the cost of eternal vigilance and the constant strain of muscles and excitation of nerve-centres which is necessary to prevent diplopia—threatened or actual—which the fusion sense abhors.

In reading of ordinary type at the normal distance the letter images are not over $1/250$ of an inch in diameter and if either retina is falsely placed to this extent the reader will see double. Indeed, the fusion faculty is excited before the misplacement is anything like so great, because the letters begin to blur as soon as one image is slightly out of its "identical" position.

How is one not trained in the technicalities of ophthalmology to know these cases if the patient does not complain of diplopia or blurring or pain in the eyes? A simple test will suffice. Have the patient fix a distant point and, using two covers, alternately cover and uncover the eyes simultaneously. If there is latent strabismus either eye will assume a false position while under cover and will move to fix when it is uncovered.

What of operation in this class of cases? Some require surgical measures and some do not. This the family physician cannot determine. It is sufficient for him to know that the symptoms are the result of ocular muscle-imbalance. The treatment embraces a number of measures known only to the well trained oculist, and the last of these to be considered is operation.

In the way of a résumé, let us refer again to the hypothetical cases stated at the beginning, with their respective indications as to operation:

1—Age five years, presents a convergent squint of 45 degrees, three years' standing with no treatment. Operation contra-indicated. Child is probably hyperopic, and should be glassed.

2—Age nine years, convergent squint of 45 degrees, has worn glasses three years. Operation indicated and should be done at once as an aid to the glasses, but always under-correcting.

3—Age twelve, convergent squint 45 degrees, since infancy with no treatment. Operation indicated at once; glasses are never successful in cases of this long-standing and such high degree.

4—Age six, glasses for two years, convergent squint with glasses 20 degrees, without glasses 40 degrees. Operation contra-indicated. Glasses are having proper effect, and will probably complete cure.

5—Age six, constantly noticeable divergent strabismus with good motility. Operation indicated at once. If the eye is blind it is important to maintain the primary position for appearance sake. If the eye is good, single binocular vision may be resumed with operation and glasses, but never by glasses alone.

6—Age twenty, divergent squint following a blow on the head, one year standing. Diplopia. Little if any adducting power. Operation contra-indicated. Muscle lacks vitality and position of the eye cannot be corrected by operation. Continue treatment and wait for more favorable conditions.

7—Age thirty, convergent squint, one year's duration, following luetic infection which has been under constant treatment during the year with resumption of motility. No diplopia. Operation indicated. as parallelism will not be resumed without operative aid, and resumption of binocular single vision is still possible but grows less probable as time elapses.

8—Age twenty-five, functional convergent squint 30 degrees, since childhood, with no treatment. Operation indicated. This patient is probably hyperopic and his squint is not high, but glasses are never successful in curing a functional squint of so long a standing.

NEUROLOGY AND THE EYE.

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IT is in the eye alone that any part of the nervous system is open to direct inspection; for here one can view the terminus of a nerve.

Elsewhere, under ordinary conditions, the nervous system is hidden from immediate observation—it can neither be seen, felt, nor listened to, and all information concerning its lesions must be derived indirectly by the study and co-ordination of symptoms. The detective who works upon clues for the solution of a crime and the neurologist who co-ordinates and interprets symptoms, and inferentially constructs from these a diagnosis, are one in their method of procedure. The one did not see the crime, the other cannot view the lesion.

But even in the case of the retina, the abnormalities are of much greater value for that which they suggest than for what they actually show; so that the neurologist, accustomed to his inductive method, applies it even here with the same degree of certainty or uncertainty that he does to his findings in structures other than nervous.

The average neurologist, being as a rule coldly scientific and very orthodox, has, in his official capacity, very little to say about the expression of the eye. He is usually a good observer, however, and just what he takes in unofficially and even subconsciously when he keenly scrutinizes his patient's physiognomy, is not formulated as a chapter in any work on modern neurology. That the eye and its adjunct appendages have great power of expression is the common opinion of all mankind, the poet even insisting that this organ is the mirror of the soul. But either the neurologist has scant acquaintance with the soul, or else fails to see the varied human emotions playing in the iris-draped pupil, since his writings make small mention of either. And as the stary, naked eyeball is certainly by itself a very expressionless thing, may we not suspect that, after all, the admitted emotional expression of that organ may be largely due to the flexible arrangement of its various draperies of lids, lashes, brows, face and even

ornament in head-dress? These things being altogether too subtle for the precise and prosaic formulary of the neurologist, he merely accepts them (as he has to do many other things which he is not so sure about)—tacitly. Concerning the “mirror of the soul” business, the average neurologist continues to smile in his patient but with firm agnosticism; for until there appears more evidence for the existence of a “soul” than two thousand years of theological effort has yet adduced, there does not appear much, if anything, to be reflected even in a mirror of this diminutive size.

In the so-called functional diseases of the nervous system—the various neuroses, psychoses and reflex disorders, the state of the eye is always the subject of neurological inquiry. And here, in the experience of the writer, it is the minor degrees of “eyestrain” or refractive defect that are responsible for the more serious reflex symptoms. The only explanation for this observation which comes to mind is that there is a more or less complete effort to overcome, by muscular action, the lesser refractive and muscular defects; while with the greater deficiencies, nature, in some degree, gives them up. The effects of eyestrain on the nervous system are not easily formulated; that is, in a manner to furnish a basis for prediction of results. Rather must we insist on the general principle that in a given neurosis, if there be eyestrain it must be removed the same as any possible source of irritation elsewhere in the body. Following this routine procedure we find that refractive or musculo-refractive defects are at times ample causes for nervous conditions. Thus the writer once saw a boy of fourteen years who had “chronic chorea” for seven years, all treatment being unavailing. On his first visit a refraction was insisted upon, and reluctantly consented to (since the boy had no obvious “eye symptoms”). Dr. Jessup, who refracted him, almost apologetically corrected a very small degree of hyperopic astigmatism. The astonishing result was that from the moment the boy wore his correction the choreic movements ceased and never recurred [observed for a period of several years afterwards].

Another case, a woman with long-lasting migraine which recurred regularly every Sunday, and yielded to no treatment, was similarly cured by Dr. Shallcross. These cases may be justly deemed exceptional, but certainly they are worth while.

Headaches may be refractive and certainly refractory. I cannot agree with the writers who attempt to formulate diagrams of the kind of headaches which are even usually ocular. Every case of headache, not obviously due to some other cause, should have an "exploratory refraction;" and here let me add another observation fixed indelibly in mind by a good many years of observation. When the neurologist wants a refraction he wants it done with a mydriatic and by a man of skill; and not in the happy-go-lucky way of some so-called oculists who doubtless would have made better paper-hangers. This observation, furthermore, gives us food for thought about the "optometrists" who insist on displaying their "art" to the serenely ignorant masses; not to proceed further and mention the wiggling of sadly dislocated vertebræ into place in order to cure myopic astigmatism!

The problem of mentally defective children and possible errors of refraction cannot receive too much attention. "Bad boys" and "ne'er-do-wells" may need the oculist much more than they require the preacher; but mental defectiveness in its lighter forms is a long chapter by itself!

Malingering has rarely come to the writer's notice, but there was one case of a young woman who got the award of a large verdict from a railroad company for alleged complete blindness caused by a blow from a swinging door. She was later seen by Dr. C. M. Thomas in Hahnemann Hospital. The doctor thrust a knife rapidly toward her wide open "sightless" eyes but she never winced. Later I, by mere chance, came across her scrubbing steps and doing house-work, and after brief investigation was the means of having the case reopened and dismissed from court.

Hysterical blindness is usually unilateral, and its diagnosis is presumptive, being based on the previous or accompanying neurotic history, the presence of some psychological shock, and the complete absence of objective evidence of eye or brain disease.

In the neurological interpretation of objective or organic conditions of the eye, we are upon fairly secure ground. Nervous phenomena may have a ready explanation in an exophthalmus. Ocular paralyses are of interest to both the oculist and neurologist. The abducens is by far the most liable to impairment in intracranial disease, by reason of the long and exposed course of the sixth nerve. In

complete paralysis of the third nerve, the symptoms are unmistakable—ptosis of the lid, dilated pupil, an everted eyeball which will move neither up nor down. Fourth nerve paralysis is suggested by the appearance of diplopia on looking downward. Paralysis of association—motility, in any of its forms, points to a mid-brain lesion, but in a manner not fully understood. The explanation may be found in lesions of certain cellular groups of the third nuclei or their inter-connecting neurons, or there may be a centre regulating oculo-motor conjugation somewhere in the basal ganglia. Transient diplopia or strabismus coming on in the adult must be placed under suspicion as an early symptom of brain syphilis.

The motility of the pupil is a reflex action in which the optic oculo-motor and sympathetic are concerned. Contraction to light implies the integrity of conduction from the retina to the anterior corpora quadrigemina, thence to certain elements of the third nerve nucleus and a returning impulse to the ciliary ganglion and the ciliary nerves to the iris. Interruption of the continuity of this arc stops the contraction of the pupil to light. Pupillary dilatation in darkness or on adjustment of the eye to distant vision is occasioned by impulses originating in the cilio-spinal centre in the upper cord, passing through the sympathetic nerves to the dilator pupillæ. These cilio-spinal centres are associated with the corpora quadrigemina by neuron extensions which pass in the tegmentum of the pons and medulla and the anterolateral columns of the cervical cord. The cilio-spinal centre in the cord is susceptible to impulses from various sources with resulting pupillary dilatation.

The Argyll-Robertson complex (absence of pupillary movement to light with preservation of its motility to accommodation) is discussed in all of the text-books and needs no especial consideration here. For all clinical purposes its presence may be regarded as presumptive evidence of syphilis of the nervous system. Occasionally it is found to be unilateral, but even in these cases, the other pupil is seldom normal in its reactions.

In cerebellar lesions nystagmus is a frequent symptom. It is worse when the eyes are turned and fixed toward the side of the lesion. If it be tumor, optic neuritis is uniformly present. In rapidly developing cerebellar lesions it has sometimes been noted that the eye on the same

side will be turned in and down, while the opposite eye will turn out and up; this has been called the "skew deviation."

A pure thalamic lesion will cause painful hemianesthesia with ataxia and jerky or athetoid movements of the affected side. Extension of this lesion to the pulvinar or external geniculate body will add hemianopsia to this group of symptoms.

In certain lesions of the crus we have a spastic hemiplegia distributed to the side opposite the lesion with oculo-motor paralysis on the side of the lesion.

Choked disc which is an œdema of the optic nerve is always attended with venous congestion and frequently accompanied by retinal hæmorrhages. It is brought about by any condition obstructing ocular circulation or which increases intra-cranial pressure. It may disappear completely upon removal of the cause, providing it has not originated a true neuritis or nerve atrophy. Choked disk may appear along with the general œdema of nephritis. It is common in brain tumors, somewhat less so in brain abscess, and may transiently appear in the case of extensive cerebral hæmorrhage.

Optic neuritis, not always to be differentiated from the preceding condition, has much the same interest to the neurologist, who finds it an index of some poisoning, infection, or gross organic disease. The general poisons which produce multiple neuritis (lead, tobacco, arsenic, mercury, alcohol) may cause it, and the same may be said of infectious diseases, chronic anæmias and diabetes. Its local causes are tumors, meningitis, abscess and hydrocephalus. In a case of optic neuritis or choked disc due to organic disease of the brain, such as a tumor, even if this is not immediately localizable, the operation of decompression may be clearly indicated in order to save vision, if possible, while awaiting indications for more radical treatment.

FUSION, AN IMPORTANT FACTOR IN OCULAR EFFICIENCY.*

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SEVERAL years ago interesting papers on fusion training were read before this Society by Drs. Wells and Cross. This paper is presented with a full appreciation of its incompleteness, as must be any paper which deals with education of the human mind. Its object is to stimulate greater interest on the part of the profession and educators in the normal development of the fusion-center in the young and its resurrection from a dormant state in adults.

The writer has been impressed, after the study of many cases in which the fusion function was more or less dormant, with the futility of trying to stimulate this function by means of mechanical measures alone. There is, at first, in these patients a lack of ideal as to what constitutes binocular single vision, and this can only be inculcated in the majority of cases by the suggestive influence of the oculist. It is a common picture to see a nurse, in teaching a delicate child to eat, separate the mouthfuls of food on the plate and personify each one; the child takes the character of a great giant who eats these children one by one. In a thousand ways are children interested and the imagination stimulated by stories, and thereby are brain functions developed. So must the adult who has an infantile development of the fusion sense be interested by argument, parable and picture to have an ideal of binocular single vision.

In the effort to relieve unnecessary nerve-drain, oculists, in recent years, have advised that even every slight errors of refraction be corrected by the wearing of glasses. We have all seen the great benefit derived from the correction of such slight faults but possibly have failed to read the greater meaning; *i. e.*, that ocular centres which are not able to overcome one-half diopter of farsight, without objection, must be

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seriously strained by muscular imbalance or lack of fusion power, even of low degree.

Routine examination of the eye, of course, includes not only the determination of the refraction but also the position of the visual lines, both for distant and near work. It seems to the writer that a test of the strength of the fusion function should be added. Binocular single vision is only possible when the two mental images are fused, and tens of thousands of times each day is the brain-centre called upon to make the proper adjustment in order that distances be gauged and proper perspective attained. To the normal adult human being perspective is so much a part of life that the *method* of its attainment is ignored. Distances are measured by triangulation, with the pupillary distance as a base line and the objective point the apex. Unless the fusion-centre is working efficiently there can be no automatic adjustment of the visual lines to this point, and hence there will be more or less diplopia whenever the attempt is made to fix the eyes upon an object. Experiments have shown that when reason is called in to play *its* parts in measurements, more than twenty times as long a period is occupied as when the work is done by the fusion centre; therefore, in the aggregate, how much more nerve force must be expended in monocular vision than in binocular? The man with two eyes but with suppression of the image is little less handicapped than the one-eyed man. In some ways he is subject to *more* nerve-drain because, while the one-eyed man trains himself to depend only on mental measurements, the one with two eyes rarely has complete suppression of the image and is continually struggling to use the partially dormant fusion-centre.

It has been said that man is born potentially perfect. Now while it may not be true in the higher reaches of our mental and physical sphere, it is true in the automatic and reflex centres which control, for illustration, temperature, pulse, and respiration. As surely as we have two eyes we have a fusion centre to control them, and under normal conditions by the sixth year this control is complete. If, because of certain deformities in the muscles, combined with anisometropia or extreme physical weakness, the nervous system is not equal to the effort of maintaining binocular single vision, development of the fusion-centre is defective and the individual habits are formed which

strive to curtail the activities calling for quick visual measurements. Thus we find adults who are totally unaware that the reason for their not liking to do fine sewing or fancy work, play tennis, golf or base-ball, use an opera-glass or look another person "straight in the eye," is due to the functional weakness of the fusion-centre. Fusion is not fully developed until the sixth year, therefore no child under that age should be required to do any long-continued work which involves accurate gauging of distance. By ignoring this natural limitation some kindergarten instructors cast a cloud over their work because of the nerve-wrecking effect their teaching had upon the children. It is as perfectly natural for us to want harmony of vision as of sound. I was much interested when my eight-year-old son standing beside me in church said, "Papa, do the people about us try to sing different songs or don't they know they are singing different songs?" His hearing was perfect and his appreciation of the different parts was keen, but he had not yet learned to blend the separate sounds into a harmonious song. Within a few months that occurrence was only a foolish memory. The sounds which go into our ears are blended into harmony by our psychic senses, so are the two ocular images blended into a wonderful perspective. This perspective is worth while. It gives us a depth of focus, a roundness and completeness of vision which out-classes monocular vision as a Rembrandt does the drawings of the Cave-dwellers. Without a well-developed fusion-function, binocular vision is like a battery of artillery without a range-finder. A war vessel can find its target by observing its first shots fall into the water, but at how much greater an expenditure of time and ammunition than to have the proper range adjusted by triangulation. So can a one-eyed human being estimate distances by mental processes, but it takes him twenty times as long and costs an inestimable amount of nerve-force *above* what is necessary to the man with binocular single vision. Let us call to mind some of the many situations which call for instant estimation of distance and fixing of the visual lines by fusion of the ocular image, viz., threading a needle, reaching for an object, wending one's way through a crowded thoroughfare without confusion of mind, using an opera-glass efficiently, playing tennis, golf or base-ball, reading music, etc.

Although the importance of the sense of perspective depends some-

what upon the occupation and temperament of the individual, yet it must be conceded that all animals that have the eyes set in the front of the head, so that associated movements are possible, are seriously handicapped if that association is disturbed. Investigations have shown that in the lower animals when the eyes are not used conjointly the control of ocular movements resides in the base of the brain, while in the higher types it passes back to the more complex centres of the occipital cortex. The whole plan of human activities is based upon the premise that binocular single vision with the power of perspective is present. The human being who has not this function is a defective. In a recent educational report the statement was made that 75 per cent. of children are defective. Looked at from one standpoint this is probably a conservative estimate. But should a child who is born potentially perfect, whose nerve-cells and functions are capable of development under the proper culture, be classed with those whose elemental cells are defective, viz., color-ignorance and color-blindness? I have under observation a child aged seven years who is suffering from symptoms of eyestrain and has been wearing a full correction of .25 of hyperopic astigmatism. Exophoria of 10 degrees in distance and 20 in acc. is present. When asked to fix the visual lines upon an object at 18 inches she accomplishes the task, but soon begins to scowl and wear a pained expression. Stereoscopic charts, that have no perspective, and therefore give less incentive to fusion, are handled in an entirely different way, that is, by suppressing one image. We see here a so-called defective in the making. The fusion-function has made a struggle to develop normally, even though handicapped by the weakness of convergence; but as the call for definite eye-work increases with advancing years the nerve-drain will prove too great and suppression of the image will become a fixed habit. With the lack of binocular single vision the child will find certain kinds of employment and recreation which require automatic instantaneous perspective too difficult, and her life activities will be diverted into other channels and she will become an environmental rather than a true defective. Was it just to this child to compel her to wear a correction of .25 of astigmatism and yet to ignore the fact that a high degree of muscular imbalance was slowly but surely throttling an important brain function and, at

the same time, causing a nerve-drain which affected normal development in other lines?

While it must be conceded that all *normal* human beings have binocular single vision automatically controlled by the fusion-centre, yet in *many* it is absent. A defect in any of the senses, which exists from birth, is usually made less important by means of greater activity on the part of the rest of the mental sphere. Habits are formed in the adult which cannot be ignored without causing marked disturbance; hence the oculist must be able to give proper weight to the symptoms so as not to advise a treatment which will upset the life-long habits without giving enough in return. This question of expediency must be taken up with the individual patient. A true measure of his handicap can be made only after a careful observation of the symptoms, temperament, method of handling the head and eyes, likes and dislikes in work and play, etc.; in other words, finding out what this defect costs the patient in nerve-force and how much of a reserve he has to expend. It is the accurate judgment of this handicap which will make it possible to wisely advise if the fusion training ought to be undertaken.

The two simplest methods of detecting weak fusion-power are

1st. Cover test. Note the rapidity and accuracy of adjustment when the eye is uncovered.

2nd. Stereoscopic pictures. Select pictures which have no perspective and note the accuracy and rapidity of fusion. I have found that letters present the greatest difficulty because if fusion has been weak, letters more than any other one thing have been allowed to remain double and the image of one eye suppressed. As will be readily appreciated, letters can be read as well with one eye as with two since no perspective is needed; therefore, no great incentive exists for a fused image and a lax ideal is formed.

Having determined that the fusion-function is dormant and that it is wise to stimulate it into greater activity, what method shall be used?

1st. Convict the patient of the errors of his ways.

2nd. Make him desire to do better, by showing him that real perspective is giving him a higher ideal of binocular vision.

3d. Let him see that it is possible to gain a better psychic grasp of the fused image.

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1. Conviction of error is as necessary to your patient for a foundation upon which to develop a better fusion-function as it is to the sinner against moral and hygienic laws before a higher ideal can be implanted. There are various methods of obtaining this result and each operator must establish his own.

(a) Worth's Amblyoscope.

(b) Wells' Interference Rod.

(c) Covering one eye, if it fails to adjust itself quickly, call the patient's attention to the interval of adjustment.

(d) Use the stereoscopic pictures and explain the reason why one picture is brighter or more easily controlled than the other or why one picture keeps fading from view.

2. Create a desire for binocular vision by explaining the need of two accurate observations for the purpose of finding the range or measuring distances. As the astronomer, in measuring the distance of a star, takes one observation at one extreme of the earth's orbit and again in six months another observation, thus establishing his base line of 180,000,000 miles and his base angles, so do we need our pupillary distance and accurate base angles if we are to measure distances automatically. Cover one of the patient's eyes and ask him to quickly bring his finger down vertically upon your upheld finger. He will realize that although he can see your finger with one eye, he cannot gauge the distance unless the two visual lines cross at your finger. Show the wonderful perspective of the Underwood photographs which is obtained by having simultaneous pictures taken by two cameras so that the pictures are similar but not identical. When these are placed in the stereoscope the perspective is the same as that obtained by the normal human ocular apparatus. When you have succeeded in convincing your patient that he has two visual images on the brain, but that he cannot use them as a single working image, and also that without this fused image it is impossible to have perfect perspective, the patient will feel discouraged and have no hope that the normal process can be established. Then it is necessary to show, under proper guidance, that fusion development is possible at any age. This can be done with the aid of stereoscopic pictures.

3. Find one or two pictures that cannot be fused; make the patient commit himself that it is impossible to fuse them; then take a

card which has *good* perspective which he *can* obtain, make it increasingly difficult for him to obtain this perspective by interposing prisms, and when you have stimulated great fusion activity suddenly slip in one of the difficult cards which will, to the patient's surprise, be fused with ease. As usually the image of the letters has been suppressed more often than any other, O-N-E (Wells, C7) can generally be selected as the difficult card while the arrows or hat frame (Wells E1) have a good perspective and can be used as a bait to stimulate fusion interest. For illustration, a woman called upon me complaining of having had severe photophobia and headaches for years. Examination showed exophoria and low fusion power. She would make no effort to fuse any of the pictures until she was shown the arrows (Wells, E6), which she fused without any apparent effort. I explained that all the pictures were just the same distance apart, and that the only reason the arrows were fused so easily was because they interested her more than the other pictures. She remarked that there was a reason for it in that her father was champion archer of England, and that archery had always been her fad. After a few lessons she was able to fuse all of the cards and her photophobia disappeared.

The two extreme cases cited below are of interest as showing in the one that the fusion-function *may* not be developed, *simply* because of great physical weakness in the early years of life, and the other that *although* fusion has been imperfect for years, because of the high degree of muscular imbalance, *yet* it can be perfectly developed in late adult life.

CASE I. Miss S., aged 43, was first seen June, 1911.

Refraction test O. D. + .25 15/15. O. S. — 75 \bigcirc — 50 ax. 30 15/15.

Exophoria in accommodation 2° - 4° , and upon addition of + .75 for close work 8° .

Fusion power very low. There was absolute inability to keep the stereoscopic pictures fused for more than a second.

Inspection of the eyes showed a slight nystagmus ensuing soon after fixing either at the distant or near point. History brought out the fact that she had non-closure of the foramen ovale, and that for the first fourteen years her life was almost daily despaired of, and that she has always traveled with a nurse. She was a very intelligent

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woman and had been to oculists in many countries because of a feeling of unsteadiness of vision; this was described by her in the following language: "When I look at anything, either near or in the distance, at first it seems clear and then begins to tremble as if heated air was rising." Exercise with the cards and with prisms wrought a very marked change in her feelings and completely overcame the unsteadiness of the globe. Her visits were several months apart, so that it took nearly a year to show marked effect upon the nystagmus.

CASE 2. Mrs. K., aged 54, called February, 1911.

Test—O. U. + .50 15/15; Rh 2°; Exophoria in Acc. 14; Fusion very weak. Rt image easily suppressed. History of severe headaches, lasting for many hours. She had been to several oculists and announced that she was absolutely convinced that the eyes had nothing to do with the headaches. Glasses correcting the hyperopia, presbyopia and 1° of hyperphoria were given and worn with ease, but headache persisted. After one month had been given in which to become accustomed to the hyperphoria correction, I demonstrated to her the need of perspective and her inability to obtain it except under the domination of a strong desire. Knowing that the poorly-developed fusion-centre had all through life made certain occupations very fatiguing, I mentioned these to her as bearing out my arguments. After having convinced her that her fusion-centre had always been partially dormant and that this state of things must of necessity have been very taxing to the nervous system, she remarked, "I am sorry that I did not know of this years ago." For answer I read from a well known author on the subject that "The fusion function cannot be developed after the seventh year of age." Then I said that in my opinion *fusion could* be developed at *any* age, and that I would be glad to undertake her treatment without cost. She agreed, and in three months she was able to sew ten hours in one day without any ill effect and fusion was almost normal, although the exophoria in acc. was still about 10°.

This spring she called because of some return of headaches, and I gave a stronger glass. At this visit fusion was perfect, even though there had been no exercises for over two years.

CONCLUSIONS.

Fusion weakness is caused by muscular imbalance accompanied by

more or less lack of nervous strength during the first six years of life.

Proper educational methods will develop this dormant function at any age.

Every thorough eye-examination should note the fusion-strength.

Steps should be taken toward a correction of the fault in an adult only when the patient can be under personal observation for several weeks.

As children can easily develop the fusion-function, tests should be made at school to ascertain if any of the pupils are suffering this handicap, and measures taken to overcome it. Our children are taught in school to articulate, to sing and to stand properly; they should also be taught to have a proper fusion conscience.

DISCUSSION.

N. BENTLEY: What cards do you use to test out the fusion-ability?

G. A. SHEPARD: Cards arranged by Dr. Wells and published by E. B. Meyrowitz, of New York City. One of the easiest ways to detect weak fusion-power is, as I have already stated, by the finger test.

N. BENTLEY: Can you not measure the fusion faculty by means of prisms? I mean get it down to an exact figure?

G. A. SHEPARD: No, it cannot be measured in figures because of the psychic factor which enters into such a test.

N. BENTLEY: I mean without muscle-balance being considered.

G. A. SHEPARD: I am unwilling to make any statement to that effect. What you can state in figures about the fusion-faculty is not worth anything. It does no harm to try to put it in figures but when you get down to practical work with an individual it does not do you a particle of good.

A. A. EIKENBERRY: When one eye has been suppressed or ignored can it be brought up by trying to fuse?

G. A. SHEPARD: I do not think it can be done, as binocular consciousness is necessary before fusion is desired. I have a patient who was first seen when five years old. She had 6 degrees of hyperphoria, 8 or 10 degrees of esophoria. She was a nervous, high-strung, beautiful child. I saw that it was unwise to try fusion exercises right away because she had suppression of the image and had not developed the fusion-sense at all.

The only way was to give her a special education—an education of the fusion-sense, which should have been already developed. By blinding the intelligent eye, very gradually I brought up the power of the suppressed eye so that she could use it without causing lacrymation and pain. In a few weeks she was able to use both eyes interchangeably. I then began to use the stereoscope. The child is now ten years old, in school, and doing remarkable work. The fusing power is almost perfect. She has the same amount of latent hyperphoria as before, but the esophoria is gone. She is placid and stout, and apparently is perfectly well. Now without that special education she never would have had fusion developed to such an extent. She may or she may not in time overcome her hyperphoria but, whether or not, she is getting to a point where it will be safe to operate upon her muscles if asthenopic symptoms appear. Good fusion power does not entirely exclude muscle-faults which act as handicaps to the patient, but it does make slight faults much less troublesome.

One thing of which I did not speak in my paper is that photophobia is a very common symptom in those who have poor fusion-power. They complain of bright light, and especially of artificial light. I noticed this for a number of years before I was able to decide whether or not it was simply coincidence. My explanation is that here are two images on the brain, one of them is habitually suppressed by an involuntary effort; now as the patient views objects in a bright light it becomes a greater effort to effect the habitual suppression, hence arises photophobia. It produces nervous irritability, which is expressed by photophobia. If a desire to obtain perspective is developed in the patient, it will be much easier to increase the fusion-function. Pictures with no perspective will give you a much truer test of fusion-power than pictures with perspective. This was shown clearly in the case cited in my paper, where the patient would make no effort to fuse any of the cards until I gave her the arrows (Javel G or Wells E6). Because of her interest in archery she obtained perfect perspective and was able to hold it while looking through prisms, base out, even though she had a marked exophoria.

G. A. SUFFA: Did you give this patient prism exercises?

G. A. SHEPARD: Yes, I gave them because they were needed to strengthen convergence. Prisms, base out, of five degrees were given

for close work, to be worn from five to thirty minutes. All prism exercises develop fusion-power to a certain degree, as they demand that the fusion-centre make greater effort to prevent diplopia. I beg to differ from Dr. Suffa in his statement that the essential value of the combined exercise of convergence and fusion rests entirely with the convergent exercise. For over twenty years I exercised with prisms hundreds of cases of weak convergence and undoubtedly thereby, in all cases, increased fusion-power. Since realizing that very many patients are suffering from an undeveloped brain function (fusion), I have made an effort to create a desire in the patient for a true perspective. When this desire has been attained a strong psychic ally has been gained which keeps the patient satisfied only with binocular single vision. Educational methods of to-day show greater appreciation of the value of co-ordinated ideas and the linking of the psychic with the material. My boy of twelve had a good ear for music, and I was much shocked when he said he did not care much for "The Pilgrim's March from Tannhäuser," as played on the Victrola. I explained to him its meaning; how Tannhäuser had deeply sinned, and these pilgrims, having given up business and home, through a sense of their own sinfulness, were making a long journey to a shrine. As they wended their way down through the mountain-passes their voices were now louder and now softer, till, as they approach the wayside cross and the kneeling Tannhäuser, the beautiful strains burst upon us in full volume, and then gradually die away in the distance. My boy was a convert. Why? Because I had told him it was high-class music and he must like it or be a dolt? No, but because I had linked all of his senses to the auditory impression.

C. C. FELLOWS: Do you do all the work single-handed?

G. A. SHEPARD: Yes; chiefly because I get nearer to my patient. You must dominate the patient and make her or him feel just as you feel.

N. BENTLEY: Do you have them take one of these stereoscopes home and use it there?

G. A. SHEPARD: Yes; as soon as I have convicted my patient of error and thus put him into a state where he can do the work with advantage. There was an old patient of mine who had a fair degree of fusion, but I thought that she had better take the exercises. I gave

her (Wells C7) O-N-E card. She could not fuse them. As she was very strong-minded, I adopted the plan of making fun of her for failing in so simple a game. She said emphatically that she could not do that in a thousand years; and my reply was I will make you do it in five minutes. Of course I knew this patient and was not going to let her get the better of me. We took a card with which she could obtain perspective and started with one-degree prism, base out, and gradually increased it to fifteen degrees. By that time she could hold the two pictures together with effort. As the fusion sense was now active the O-N-E card was slipped in without prisms and easily fused. She acknowledged it and said it was remarkable and gladly took up the exercises. That shows that you must adapt yourself to your patient. You can do it to most all of them but you have to use different methods of handling them.

ETHMOID DISEASE AND ITS RELATION TO GLAUCOMA.

J. IVIMEY DOWLING, M. D.,

Albany, N. Y.

THE symptoms of glaucoma are well known, the local pathological changes recognized, but the actual cause is still to be determined.

Treatment has been resolved into the use of miotics for the immediate control of the more active symptoms of the disease. Operative procedures are successful in certain types, but withal are of uncertain permanency, as is witnessed by the great variety of methods designed since Graefe first determined the usefulness of iridectomy.

The success of an Elliot operation is considered satisfactory if four years elapse after the performance of the operation and final onset of blindness.

The very fact that so many failures occur after properly performed operations and the judicious use of miotics suggests that some link is missing in the needed knowledge of glaucoma.

It is likely that actual cure can be accomplished only after the true causal factors are determined. The neurotic element, gout and other systemic states, certainly aggravate and induce the acute manifestations, but that they are the actual causal factors is not actually proven.

The various theories as to the reason for increased tension are instructive, but to the writer do not seem fairly explanatory.

Fischer's Colloidal theory seems to the writer a step in the right direction and the experiments of McCaw apparently corroborate many of Fischer's ideas. However, even in accepting the theory that "Glaucoma depends upon an œdema of the eyeball, in which the hydrophilic colloids of the eye retain an increased amount of water," the manner in which this takes place is not explained.

In October, 1910, the writer published an article in the *Homœopathic Eye, Ear and Throat Journal* under the title of "Relief of

"Glaucoma Simplex by Means of Intranasal Treatment and Surgery." In that paper the following statements were made:

"My researches into the mysteries of glaucoma lead me to the belief that Knies was correct in his statement that there may be a specific glaucoma poison, and I believe that this is the true explanation not alone of congestive glaucoma but also of glaucoma simplex. Observation upon a series of cases tends to favor the reasonableness of the retention theory, and the entire train of symptoms may be explained in this wise:

"I hold that glaucoma may be secondary to some previous disease of the nasal accessory cells or sinuses, and probably most often of the ethmoid cells.

"The various possible causal factors all yield to this reasoning. The nervous element may be explained by the fact that the nasal nerve as it passes through the ethmoid cells may be irritated, and through its relation to the lenticular ganglion and the long ciliary nerves the ciliary body (or secreting portion of the ocular media) may be so influenced that its function is perverted. Vasomotor disturbance may ensue and congestion of the uveal tract is a sequence. Furthermore, the ocular media are altered from their natural crystalloid state and through albuminous changes they become colloidal in nature, thereby hindering the normal outflow by way of Fontana's spaces and Schlemm's canal, and the possible osmosis through the venous channels is impaired. Hence, through a combination of factors retention of secretion follows, and the symptoms are still further increased by the gradual apposition of the iris over the ligamentum pectinatum with obstruction of Fontana's spaces.

"Knies' theory of a 'specific glaucoma poison' may be explained through the *theory of positive infection*, which idea I now submit as an original corollary in explanation of Knies' theory, first advanced in 1890.

"The method by which this ensues may result from streptococcic, staphylococcic or other infection of the ethmoid cells or nasal accessory sinuses, which having become infected act as natural laboratories in which the germs multiply and develop toxins which may be conveyed by way of vascular or lymphatic channels to the uveal tract and

so occasion *the change from crystalloid to the colloidal state, this change being the sine qua non of glaucoma.*

"Providing that this theory is true, then relief of glaucoma symptoms should ensue upon appropriate intranasal treatment or surgical interference."

Continued study and more recent clinical observations have led me to the belief that the *intra-ocular changes and increased tension, in at least a fair proportion of cases, are secondary to extra-ocular pressure, and that the colloidal changes are induced by circulating toxins originating in infected ethmoid cells or other accessory nasal sinuses.* That these statements are facts seems to be borne out by the following experiment and clinical records:

EXPERIMENT as to tension is readily accomplished by taking the tension in a phlegmatic patient, and while the tonometer is in place inducing a gradual pressure at the side of the eyeball; the needle will then slowly swing over to the left and an increase of several mm. of hg. may be obtained. This experiment is at least suggestive that extra-ocular pressure may be a causal factor in the induction of ocular tension.

CASE I is a patient suffering from a pronounced mydriasis, seemingly parietic and of peripheral origin. This was complicated by catarrhal ethmoiditis of the same side. An ethmoid operation was performed, and the pupil was reduced in size immediately by the operation from 5 mm. before the operation to 2 mm. after surgical interference.

CASE II illustrates the positive association of the ethmoid and ocular circulation, and was as follows:

J. H. M., age 47. Presented with history of long previous injury to right eye from lodgment of fine shot in eye, which rendered it blind from traumatic cataract and subsequent iridocyclitis, with resulting posterior synechiæ. At the time of consultation the eyeball was soft and generally irritable, being in early stages of panophthalmitis. Small hypopion was present. Vision was nil.

A most peculiar condition in this case was that the iris of the right eye was *brown* while that of the left eye was a typical *blue*. No signs of intra-ocular irritation were evident in left eye, and vision = 15/40, and with correction = 15/20.

The purpose of consultation was to secure relief of inflammatory symptoms in right eye and to avoid enucleation if possible.

Immediate treatment by the author's nasal tamponade method effected much relief to the symptoms, *and in addition occasioned a change in the color of the iris of the right eye*, which positively proves the intimate circulatory relationship between the nose and eyes. *The change noted was that the brown iris changed to green*, and this re-sorption of pigment required only two hours of treatment. Further treatment relieved the symptoms of irritation and the hypopion was reabsorbed. Of course no vision was secured, but the irritation was overcome and the necessity of enucleation avoided.

CASE III. This case is interesting because it is cited as Case V in a previous article, entitled "Relief of Glaucoma Simplex by Means of Intranasal Treatment and Surgery."

This case is reported merely to illustrate the possible influence upon ocular tension that hypertrophied middle turbinated bodies may exert. This patient first consulted me on November 21, 1908, exhibiting all symptoms of an active glaucoma in the left eye. Tension at that time equalled plus 3. An unsuccessful iridectomy had been performed in New York a year before. Subsequent to operation there had been absolutely no relief to any symptom, and the eye was totally blind when the patient presented herself for advice. An additional interesting point was the exhibition of divergent strabismus, which was relieved by intranasal surgery and without any operation upon the ocular parts.

The right eye was irritated, and vision equalled 15/30. The field of vision in this eye was roughly estimated by means of candle-light, because the presence of extensive corneal maculæ precluded any delicate tests. The extent of the field warranted the attempt to save the blind eyeball in lieu of enucleation.

Purulent ethmoiditis of left side was present and the drainage was obstructed by the presence of a hypertrophied middle turbinated body. The infection was of mixed streptococcic and staphylococcic variety, and the inflammatory state of the eye was plainly of metastatic origin.

Operation was performed for removal of the anterior half of the left middle turbinated body. This was done on February 21, 1909, or three months subsequent to instituting treatment by means of nasal tamponades saturated in argyrol solution (forty grains to the

ounce). By means of this treatment the naris was prepared for operative interference and many of the distressing symptoms were relieved.

The effects of operation were most successful, for within twenty-four hours after amputation of the anterior half of the middle turbinated body the tension was reduced from plus 3 to normal, and in addition the divergent strabismus was corrected. Since the operation the tension of both eyes has never been above normal, although on two occasions, with the consent of the patient, an experiment was made of placing a saturated atropin solution in the conjunctival cul-de-sac of the blind eye in order to determine if tension would ensue. *The result was absolutely negative, which seems to be positive proof that hypertrophy of the middle turbinated bodies and purulent ethmoiditis may exert considerable influence upon tension.*

Since the above report was originally submitted the left eye was enucleated—in March, 1912. The eye never exhibited any rise in tension after the intranasal operation and the enucleation was performed merely for cosmetic reasons. The right eye has never exhibited any suggestion of glaucoma and the vision remains 15/30, as recorded some seven years ago. Also the visual field shows no contraction. This was a monocular glaucoma of simple variety, exhibited on the same side as the ethmoid disease. The eye in which there was no complicating ethmoid disease has never exhibited glaucomatous symptoms.

CASE IV. Mr. M., age 62. History of glaucoma of the right eye, mastoiditis of the same side and catarrhal affection more marked upon the right side. At the time of consultation the following notes were made: V.—O. D. Nil. O. S. 20/20. Tension with Schiotz's Tonometer—O. D. 75 mm. hg. O. S. 22 mm. hg.

Nose. Extensive polypoid degeneration right turbinated and ethmoid region. Incipient polypoid degeneration of the left middle turbinated body. Radiographs merely corroborated the clinical findings.

Nasal depletion by means of the argyrol tampons, according to the author's method, reduced the tension of both eyes; that of the right from 75 to 68 and of the left eye from 22 to 17, and this reduction of tension was accompanied by a *positive contraction of the pupils of both eyes*. This patient was placed in the hospital and operated most

ETHMOID DISEASE AND ITS RELATION TO GLAUCOMA.

radically, it being necessary to perform an extensive submucous resection in order to gain access to the ethmoid regions. After accomplishing the submucous resection an exenteration of the right ethmoid labyrinth was performed after Ballinger's method, and on the left side the middle turbinated body was excised.

Subsequent to the intranasal surgery and without the aid of miotics the tension was reduced in the right eye from 75 mm. hg., as originally determined, to 45 mm. hg.; and in the left eye from 22 mm. hg. to 15 mm. hg. The pupils have remained contracted without the aid of miotics. The visual field of the left eye is slightly contracted on the left side. The vision of the blind eye is uninfluenced by the operation.

Symptoms of tension and other glaucomatous symptoms were all positively improved soon after primary nasal depletion and still further benefited after surgical interference. This case is still under observation and will serve for a more detailed report later.

116 Washington Ave.

DEMONSTRATION OF THE OPHTHALMOTROPE.*

GEORGE A. SUFFA, M. D.,

Boston, Mass.

THE ophthalmotrope that I exhibit to-day has been improved by placing the recording system (tables) horizontally side by side so that the action of the ocular muscle can be seen at a glance; doing this has made it possible to use piano wire and by harnessing the horizontal, vertical and oblique muscles in pairs, and carrying the piano wire or extension over pulleys arranged on spiral spring-carriers to keep up equal tension assures accurate reading in all ocular movements, and not only comprehensively shows the active and passive action and combination of action of the ocular muscle in the various normal ocular movements but also in the simple and compound form of strabismus. Torsion can also be demonstrated—the table showing the muscles and the degree they are involved in the act. The contact-arcs of the muscle and their unwinding during active action and their increased contact while passive is clearly followed.

The great aid the accessory muscles render any principal action is readily seen, especially the aid the superior and inferior recti render an internal rectus in convergence, due to the fact that the force is transferred and exerted at their attachment to the globe and not at the contact-arc, as is the case in all principal actions of an individual muscle. While principal actions seem to be started by one muscle there are always at least two muscles that become accessories, rendering their aid by relatively very much less contraction than is made by the principal muscle.

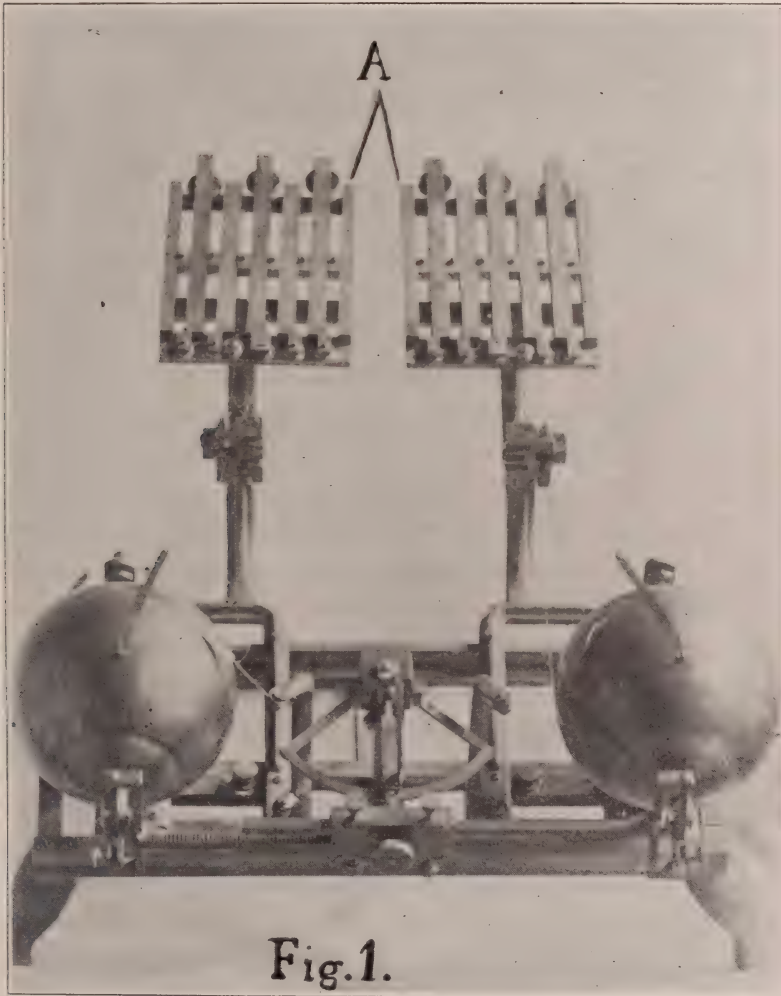
The tables also open a very interesting neurological problem, which will be presented at a later date.

(Photograph.) Figure 1 is a view taken from in front and above—the camera placed at the viewpoint of the operator. The advantage of placing the recording tables horizontally is seen at a glance. The

*Read before the O., O. and L. Society in Chicago, June, 1915.

DEMONSTRATION OF THE OPHTHALMOSCOPE.

eyes are rotated to the right. The position of the indicators on the recording tables, A, show the action of the muscles concerned. For a full description of the Ophthalmotrope see March, 1915, issue of *JOUR. OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY*, page 246.



DISCUSSION.

F. C. SAGE: What is the principal practical application of this instrument?

G. A. SUFFA: It has several applications. The accuracy and readiness with which a comprehensive understanding of both innervation and muscular action in ocular movements can be obtained makes

it valuable in teaching. It also not only accurately shows the muscles involved in heterotropia but the amount of their involvement in degrees, and this is of practical value in operative procedures.

EDGAR J. GEORGE: The trouble with Dr. Suffa's instrument is that it puts the cart before the horse. With his model the eyes move the muscles, which is against the anatomical mechanism, for here the muscles follow the eye-movements instead of producing them, and the true action of the muscles is to move the eyes. Listing, a physiologist of the 19th century, about 1857 established a law by dividing the eye into two planes. He drew an imaginary horizontal line through the equator of the eyeball and then drew another vertical line intersecting it. These were called the two principal or primary planes. Lines oblique to them were secondary lines, and the eye was considered to rotate these planes from the equatorial centre. Dr. Suffa's model demonstrated this point, the eyeballs resting upon a ball-and-socket joint with the posterior portion of the eyeball cut out, when in fact the eyeball is supposed to rotate posteriorly in Tenon's capsule like a ball-and-socket joint and not upon a pivot. I contend that the movements of the eyes are not as Listing supposed. Anatomically they are unable to move so. The true movements of the eyes are oscillation and not equatorial rotation.

G. A. SUFFA: It makes no difference whether the movements of the eyes in the instrument are made by moving the slides on the table or whether the eyes are moved by the connecting link that holds the eyes together and parallel. The reading would be the same and accurate in either case.

Listing's plane is a theory of the past; Savage has made that clear in his book *Ophthalmic Myology*. I advise its careful reading.

E. J. GEORGE: That is theoretical—not practical.

G. A. SUFFA: The absence of elasticity and the fixed relation between the parts under discussion in the instrument make it impossible to show variation in readings in whichever way the movements are made.

FUNDUS CHANGES IN SUPPURATIVE INTRACRANIAL DISEASE OF OTITIC ORIGIN.

JOSEPH V. F. CLAY, M. D.,

Philadelphia.

FUNDUS changes in intracranial suppurative disease of otitic origin are usually more constantly observed in otitic meningitis less frequently in sinus thrombosis and cerebellar abscess and infrequently in cerebral abscess.

In otitic meningitis the fundus changes noted vary from simple engorgement of the retinal veins to papillitis, choked disc or optic neuritis. The condition may be so severe and rapid and the toxemia so intense that the patient succumbs before marked changes occur in the fundus.

The presence of hyperemia of the optic nerve head, or the presence of choked disc or optic neuritis in a case presenting clinical manifestations of sinus thrombosis would suggest an obstructive condition, and this usually on the side of the lesion. The venous arrangement of this area clearly demonstrates the reason for this. The ophthalmic veins passing backward through the sphenoidal fissure practically become the cavernous sinus, which in turn is drained by the superior and inferior petrosal sinuses. The former drains into the lateral sinus; the latter opens into the upper end of the jugular vein. Obstruction of the lateral sinus would occasion interference with drainage of the superior petrosal sinus and throw the drainage of the cavernous sinus and ophthalmic venous channels upon the inferior petrosal. If such obstruction is progressive the cavernous sinus will be obstructed, and a septic clot in this location would interfere with the function of the nerves passing through the sinus (3d, 4th, ophthalmic division of 5th and 6th nerves). Clinically, such a pathological process would present edema of the eyelids, loss of conjunctival and corneal sensation, proptosis and immobility of the eyeball. This condition is the extreme and its occurrence is rare. Sinus

thrombosis does not invariably produce ocular changes and absence of these is of no value in excluding a diseased sinus.

Changes in the fundus in brain abscess (cerebral) may be said to be the exception rather than the rule, as in cerebral tumors, and papillitis is more often observed than optic neuritis. In the Urbantschitsch clinic a large series of cases of brain abscess were examined, and in all cases of otitic brain abscess of the temporal lobe and in the majority of cases of cerebellar abscess fundus changes were absent. We do find cases of brain abscess presenting fundus changes. In Dr. Palen's Otological Clinics in Hahnemann Hospital and the Woman's Homœopathic Hospital we have observed in a recent series of eight cases, optic neuritis present in two temporal lobe brain abscesses, and choked disc in two cases of cerebellar abscess.

It would seem strange to note the absence of fundus changes in cases presenting large brain abscesses, while pronounced fundus changes occur in very small cerebral or cerebellar tumors. This absence of fundus changes may be accounted for by the fact that the encephalitis spreads by causing adjacent parts of the brain to become directly involved in the inflammatory process, thus softening occurs and less pressure is exhibited. Again, brain abscess usually develops rapidly, and for this reason the characteristic changes in the optic nerve head have not had time to develop before the patient dies or the abscess is located and operated.

Typical optic neuritis in a case presenting clinical manifestations of brain abscess would suggest the possibility that the brain lesion had existed for a time, exerting continuous pressure; and clinically we know such slowly growing abscesses are usually well walled off by a capsule. In this respect the presence of fundus changes might be of prognostic value. Where observed, optic nerve changes in otitic brain abscesses have no value as localizing information. Indeed cases have been observed where the abscess was on the side opposite to that on which the intraocular changes were noted.

Clinicians are agreed that fundus changes, choked disc, papillitis or optic neuritis are more frequently observed in cerebellar abscess than in cerebral abscess.

2102 Chestnut St.

REFRACTIVE DEFECTS IN THE EYES OF SCHOOL CHILDREN.

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Philadelphia, Pa.

“SAM is positively the worst-behaved and the most backward pupil in his school,” so declared the school-nurse about a lad whom she had brought to the clinic for eye-examination. Though the statement of the nurse was corroborated by his teachers and principal, and the damning evidence of his being four years in the rear of his normal grade—still Sam gave indications which led us to believe some of the better things said of him by his mother, who was sure nothing ailed him, and more certain that he required no glasses. Under cycloplegic Sam showed an existing mixed astigmatism of high degree, which necessitated the use of a 5-dioptric cylinder to correct, the application of which produced almost normal vision over the hundredth that his unglassed eyes possessed. Since seeing is believing, Sam waved aside his mother’s biased judgment, delighted with the new look things took on; he wore his glasses faithfully; returned to school and made good progress in his studies. The discipline of the school was no longer threatened, for Sam’s new sight made him diligently intent on the work going on about him, and the once idle, shut-in brain had no more need to turn to mischievous pranks to while away the heavy time.

With Sam’s case in mind, all the bad and backward children were rounded up and rushed to the clinic—with drops in their eyes and high hopes on the part of those concerned for the possibility of an exemplary school; but, let it be recorded, there are still bad and backward children in that school and Sam’s reformation remains the crowning achievement. It must be said, however, that good and encouraging effects were produced in many cases and it proves furthermore that no child should be declared bad or backward until its eyes have been examined under a cycloplegic—bearing in mind that glasses are

not always the answer and that much depends upon the personal equation of the child.

JOE was twelve years of age when he was first refracted. He presented a compound hyperopic astigmatism which required a $+ 4.50$ cylinder combined with several spherical diopters to neutralize. Surprise was expressed that there had been failure to bring out this defect in past tests to which he had been subjected by the inspectors—the history of which he was quite proud to relate; but the mystery was unveiled in the telling.

He was an alien and at an early age had been taken from the steerage to the class-room and for several years he limped along, showing poor progress and likewise poor vision. Both were attributed to innate dullness and not to defective eyesight. At subsequent inspections he, together with several others, told off the test-card symbols from memory, having studied the popular universal card, which was always invitingly and conveniently exposed. His undoing came, however, when in facing a strange card he chanted the lay of the old familiar one, and the inspector tumbled to his little game, with the result that he was hurried to the clinic for a correction of his faulty vision.

The cases of Sam and Joe are only two instances wherein children by means of trickery, oversight or parental prejudices evade necessary glasses for years; they serve to emphasize the argument that eye-examination should be urged upon every child when he reaches school age. Every refractionist has met his quota of glaring visual defects; defects that existed from birth or began with school-duties. These are often encouraged by neglect combined with ill-use, and the mischief has not only increased but very likely has harassed mental progress and caused no end of physical disturbances. Whereas, if the proper correction had been applied at a tender age, at a time when the imperfection was amendable, or at least could have been made to remain insignificant, in many cases it would have helped not only to conserve the sight, but to render the patient more fit for the struggle of life.

The effect of heredity on the optic tract is denied by many authorities, but they admit the possibility of predisposition. Nevertheless, in no other part of the human make-up do we find more conclusive

proof of the evils of heredity than is presented in the history of most ocular defects. The question arises whether or not children are born with existing refractive errors; and one accustomed to examining youngsters' eyes is struck by the number and degree of errors encountered at the primary or kindergarten age. We know that infants are not capable of concentrated vision for some time after birth, and at no time up to six years are they required to tax their eyes—unless the muscular efforts the tot makes in gazing through sharp arcs at moving objects, or fixing its gaze on attractive toys dangled at trying angles may be said to bring undue muscular pressure to bear on the plastic eye in certain instances, and bring about these gross defects. It is hardly probable that differences in the material consistency of the eyes would explain the less rapid increase in refractive errors after this time, notwithstanding the fact that a much greater effort is demanded with the beginning of school duties.

It is not uncommon to meet a refractive defect requiring a cylinder of 4 diopters or more at ages ranging from four to six years, and examination three and four years later shows little increase. Some wore their glasses faithfully and some did not, and the average increase in the cylinders amounted to half a diopter, together with a correspondingly small increase in the sphere, (excepting cases of suspected progressive myopia and some mixed astigmatism, where the increase was greater). It seems consistent, then, to believe that some children are born with a certain amount of refractive error which for the most part corresponds to the parents' refraction. This has been noted by comparison of the child's correction with that of the parents when the latter appear wearing thick astigmatic or myopic lenses. On the clinic files are the records of three school-children of the same Italian family, each having been refracted about the age of eight: and in each child the findings average 17 diopters of hyperopia. The mother put in her appearance wearing a + 12.00, and an older brother was said to be wearing lenses quite as thick as the others. This may be called predisposition, but it is not so conclusive as when laid at the door of hereditary evils.

ABE's myopia has increased from — 4.50 to — 6.00 and recent examination shows — 7.00, the proceedings extending over a period of four years' time. His fundi present the typical ear marks of progressive

myopia which results so disastrously to the sight of its victim. As is always the case in this class of patients the boy is a studious grind; he is intelligent, has a neurasthenic trend and foregoes the pleasure of the play-ground for a quiet corner and the ever-interesting book. Again and again he is cautioned as to the sparing and judicious use of his frail eyes, to which advice he evasively replies. He wants education; he must have it, and he is going to get it come what may. What alternative can be offered him. He will go the way of others similarly afflicted with scant vision left at forty. If youths with poor vision or suspected of progressive myopia were trained along some vocational line where the demand on the visual apparatus was reduced to a minimum, and the work combined with life out-of-doors. at twenty we would have a rough-and-ready chap more to be desired, more useful and more effective than the scholarly, neurasthenic asthenope that Abe is heading to be.

The proper age at which a child should start school should depend upon his state of health and the condition of his eyes. The eyes and the general system are closely related. An under-developed, poorly-nourished child may complain bitterly, and yet manifest but little imperfection; but we know that the visual act demands good rich blood, and a perfect balance of which only muscles of good tone are capable; so minor defects, that would pass unnoticed in more rugged children, in children of lowered nutrition become an item of importance. No child should be expected to do a full day's work at school until the age of ten is reached; night work should not be attempted before the age of twelve, and constant attention should be maintained to recognize any symptoms of failing eyes.

After the effects of the atropin had worn off JIMMY returned to the clinic and declared he could see much better without glasses than with them. He had the statement of the nurse who accompanied him to bear him out, and she had the word of the teacher and a note from the inspector to the same effect. Digging his battered and bent glasses from his pocket, where he was now wearing them, and applying them to his eyes, it proved as Jimmy had said; but when his left eye was covered he could scarcely discern the largest test-types, the right eye being defective by reason of a high compound astigmatism while its fellow was only slightly hyperopic. With

the glasses this hyperopia of the good eye was fully corrected although it was intentionally blurred somewhat with a hope of bringing up the vision of the poorer eye. But this idea was above Jimmy's, his mother's and even his teacher's head, who for the life of them could not see the logic of making a good eye "blind" just because the other happens to have poor sight.

ROSE was an Italian lass of eight, dirty of face and of dress, but with all the seriousness that shone from her dark eyes, desperately in need of the glasses she laid on the clinic desk, declaring—"Her mother didn't want her to wear glasses because they distracted from her beauty." It is hard enough to convince children of the good glasses will render when necessary, but the well-nigh impossible is approached when, for some silly objection, ignorant parents hold out against their use.

Probably the most common symptom of a child suspected of eye-strain is headache, and where the refraction is nearly normal with perfect balance we must look to other causes; usually the state of the tongue will lead us to think of gastro-enteric disturbances brought about by decayed teeth, faulty habits of eating or improper or impure food.

An evil that is prevalent in the poorer classes is the ever ready coffee-pot that graces the stove from morning until night, and from its magically inexhaustible depths the children are abundantly supplied with its concentrated contents. To this source we can trace many disorders of school-children, and its effects on the alimentary tract cannot be disputed. Another evil which might explain some headaches that exist without apparent cause, especially in the children of the more congested sections of cities, is the futility ventilated and over-crowded sleeping-quarters; and when we take these conditions into consideration we are led to wonder why there are not more headaches and more dullards as a consequence of the poisonous gases these children inhale in the nightly mingling of so many breaths.

THE RELATION OF EYE DISEASES TO KIDNEY DISEASE.

WILLIAM STEELE, M. D.,

Philadelphia, Pa.

THE object of this article is to bring before the mind of the specialist and general practitioner the need of thorough investigation into the cause or the thing which lies behind the symptoms for which the patient consults you. In past years the patient was generally treated for the symptoms of which he complained and no search was made for the cause, but to-day this is considered very bad practice, especially when we have at our hand the research work and scientific investigations which give us accurate knowledge in discovering the cause and effect of diseases.

In observing puffiness of the eyelids, after excluding local conditions, one would be led to investigate the condition of the heart and kidneys, and by doing this often find the cause in chronic parenchymatous or chronic interstitial nephritis.

The conjunctival œdema of Bright's disease, in which the bulbar conjunctiva becomes prominent, shiny and obviously œdematous, on close inspection should hardly be mistaken for inflammation, even when the vessels are dilated by passive hyperæmia, as they often are.

Amaurosis is total blindness, either with or without any perceptible intraocular lesion, and may be caused by pregnancy, diabetes or uremia. Bilateral contracted pupil (miosis) is one of the objective signs of uremia. Cataract frequently accompanies diabetes mellitus. Hæmorrhagic retinitis usually occurs in old people and almost always accompanies chronic interstitial nephritis. Albuminuric retinitis is found in Bright's, diphtheria, scarlet fever or pregnancy. Let us for a few moments refresh our minds with the three forms of nephritis.

I. Primary Acute Nephritis in the adult is the hardest to diagnose. The majority of cases diagnosed as acute Bright's are really suffering from an acute exacerbation upon the top of an already existent chronic nephritis. Acute nephritis is probable if it is known

that the urine was free from albumin up to the time of the attack, if the patient is known to have suffered recently from scarlet fever, pneumonia, diphtheria, secondary syphilis, or some other similar fever, if the heart is of normal size and its sounds normal, the blood pressure natural and the retina of the eye healthy.

If, on the other hand, it is found that in a case of apparently recent acute nephritis, with general œdema, hematuria and the other urinary changes, there is cardiac hypertrophy with a prolonged first sound at the apex, a ringing aortic sound, a blood pressure of more than 150, and possibly albuminuric retinitis, the case is one of an acute exacerbation of an unsuspected chronic nephritis.

2. Chronic Interstitial Nephritis (Small Red Granular Kidney, Cirrhosis of the Kidney, Arteriosclerotic Kidney) : Kidney small, hard, contracted and nodular with adherent thick capsule. Chronic inflammation in the kidney with an overgrowth of the connective tissue of the stroma, which may be uniform throughout the kidney or may occur in isolated areas. This latter condition accounts for increase in amount of urine associated with fairly normal urea output. With the growth of connective tissue you have atrophy of the glomeruli from pressure of the surrounding new tissue. Blood pressure in the remaining Malpighian tufts is raised and diuresis is increased. The left ventricle of the heart becomes hypertrophied in proportion to the changes in the kidney.

The characteristics of chronic interstitial nephritis are its insidious onset and its slow course, rarely following an acute attack—being as a rule chronic from the very beginning.

In the majority of cases no diagnosis of the condition is made until secondary changes or complications have called the patient's attention to his condition. Increased arterial tension is the most important early symptom. Patient complains of malaise, headache, palpitation of heart, cough, dizziness, ringing in the ears and loss of appetite. Hypertrophy of heart is constant. There are retinal changes, uremic amaurosis, sudden blindness, cerebral apoplexy. Dropsy is not a marked feature while cardio-vascular changes are very pronounced. The skin is dry and pale; ankles may be puffy; urine is abundant, of low specific gravity, deficient in urea and contains albumin and a few casts.

Death occurs from some complication, as cardiac degeneration, cerebral hæmorrhage, dropsy, uremia, acute or chronic cachexia.

3. Three types of Chronic Parenchymatous (Glomeruli) Nephritis are pathologically distinguished.

(a) Large Kidney—reddish hue in color and thin capsule easily stripped off, in which the morbid process affects chiefly the epithelium.

(b) Small White Kidney, where with the changes present in the epithelium there has been a gradual increase in the interstitial tissue and secondary contraction. This may be a late stage of the large kidney or a primary condition.

(c) Chronic Hæmorrhagic type. In this type, in addition to the ordinary transudation from the bloodvessels, there is also a passage of blood through the glomeruli.

Patient has a pasty, waxy pallor, which is due in part to anemia and in part to subcutaneous edema. Dropsy is very marked and obstinate. Marked muscular debility. Patient complains of dyspnea, headache, nausea, vomiting, diarrhea, puffy eyes, dropsy, anemia, accelerated and high tension pulse. Urine scanty and turbid; epithelial casts; leucocytes; red blood corpuscles; albumin. Urea reduced. (Reducing the amount of proteid in the food reduces the amount of urea also.) Retinal changes occur. Specific gravity 1020-1025. Heart hypertrophies.

Uremia is not so common a symptom in this type as in chronic interstitial. Patients worse in winter and better in summer. Some cases begin with a marked anemia, more or less progressive, and these cases are often mistaken for pernicious anemia.

Patients usually die from extreme dropsy,—subacute nephritis developing, or chronic uremia.

HEMIANOPSIA.*

GRANT S. PECK, M. D.,

Denver, Colorado.

THE case herewith reported is believed to be of sufficient interest to be presented to this society, both because of its initial attack and because of the subsequent history. The patient, Mrs. M. A. F., aged sixty, while travelling on an eastern train was taken with an attack of nausea and dizziness which compelled her to remain in her stateroom in a recumbent posture for several hours. A stop of a day or two was made in New York and then the party went on to Boston. After a short time the dizziness and nausea were somewhat relieved and were attributed to an attack of indigestion. Improvement in the symptoms was gradual, but at this time she discovered that she was unable to see things to the left. Having an acquaintance with Dr. George B. Rice the patient consulted him and he referred her to Dr. G. A. Suffa, who made an exhaustive examination and to whom I am indebted for a report of his ocular findings. Dr. Suffa referred the patient to Dr. E. P. Colby, who examined her with reference to the nervous condition, and his report is also given.

Under date of October 31, 1912, Dr. Suffa writes me as follows: "Dear Doctor,—Mrs. M. A. F. called to see me by special appointment last Sunday, having had an attack of dizziness when going to the breakfast table last Tuesday morning. Later she found she could not see on the left side, or 'with the left eye,' as she expressed it. I enclose a tracing which gives the field for white in both eyes, showing absolute loss of vision of nearly the whole of the left field for both eyes. The ophthalmoscope shows both fundi to be normal. As the disturbance was evidently on the right side, of central origin, I referred her to Dr. E. P. Colby, who is of the opinion quite positively that the lesion has occurred in the extreme end of the posterior limb of the internal capsule. The patient does not know the true character of the

*Presented at the Annual Meeting of the O., O. and L. Society, Chicago, June, 1915.

trouble and was encouraged to attribute it to some slight digestive disturbance which she has. I took the blood-pressure and found it only 120, which with other evidences available indicates that there is no general hardening of the arteries. I have not found it necessary to change her lenses, but have warned her against over-exertion and given her merc. biniodide, 2x. If she does not improve I should suggest K. I. or some other form of iodine."

In his letter to Dr. Suffa, Dr. Colby writes: "In the case of Mrs. F., of Denver, I cannot think the jarring of the cars had any part in the etiology. I believe it was the result of a vasomotor disturbance in the brain similar to that which causes angioneurotic edema in various regions. It may have been a reflex from digestive errors. At any rate, it was enough to cause a small vessel to give way. I should advise that she give special attention to her digestive organs for a few months to come."

Upon her return to Denver, aside from some nervous apprehension she seemed to be in good health. There was entire absence of sensory or motor disturbances, digestion was good, and nothing having any bearing on the causation of the hemianopsia was apparent. Merc. protoiodide, 3x, and such attention to diet as seemed advisable were prescribed. As this patient has been under my care for more than twenty years her history and general habits of health were well known to me. During that time she has had very little sickness; an attack of pneumonia several years ago and such other minor ailments as anyone would have. There has never been any kidney trouble, heart action has always been good, and her habits of life that of the average active person. There was nothing significant in her previous history.

In September, 1913, there was another attack of dizziness and nausea, with some general weakness and prostration. At this time Dr. George Neuhaus, a local neurologist, was called in consultation. A thorough examination was made by him as to the reflexes; we had a blood test made, the urine analyzed and such other measures taken as were necessary, and all of them were negative. Dr. Neuhaus was of the opinion that her trouble was due to digestive disturbance and possibly some neurasthenia.

A year later while in the higher altitude of their mountain cottage, following an attack of indigestion (to which we then attributed these

attacks but which I question now) another attack came on, followed in a week by another, in which for the first time aphasic symptoms developed. The nausea and dizziness were rather more persistent than previously but the impairment of speech—which at the time was so marked that it was almost impossible to understand what the patient was attempting to say, the words coming very slowly and with much effort—has never fully cleared up. To one not accustomed to her manner of speech it would not be noticed, but there is a hesitancy in conversation and generally a consciousness on her part that there is some defect in her speech. In this attack the pulse was very weak, soft, compressible, and the beat increased in frequency: the skin was pale, ashen and flabby, and the patient was very nervous and apprehensive. Within a week there was another attack, which, while much lighter, made us very anxious as to the outcome of such attacks. It was several weeks before we felt safe in taking an auto journey of thirty miles to her home in the city, although part of this delay was on the grounds of prudence.

In the past eight months there have been two or three slight attacks which readily cleared up. A few days ago after a week of rather strenuous activity and contrary to advice an attack of aphasia came on in which difficulty of articulation as well as the use of wrong words were noticeable, but none of the heart weakness or prostration was present.

From a careful study of this case it has been impossible definitely to determine the exact nature of the lesion, but from the weakened condition of the vessel walls and the absence of any other permanent symptoms it is probable there was not an actual hemorrhage, but possibly a slowing of the blood stream causing a temporary (?) thrombus, which upon putting the patient at rest cleared up. Undoubtedly the first attack was, as Dr. Colby suggested, a lesion of a small blood-vessel which caused the hemianopsia and from which this patient has not recovered.

A sufficient number of cases have been studied to enable quite definite conclusions to be drawn as to the location of the lesion along the course of the visual tract to produce hemianopsia; and through the study of these cases even to attempt to ascribe localization of particular portions of the retina to particular portions of the optic centre. Mills

says, "Authorities seem to agree that the primary or lower visual area is largely on the meso-tentorial surface of the hemicerebrum, while much difference of opinion as to exact boundaries exists. These limitations vary from the confines of the calcarine fissure (Henschen) to the inclusion of the whole meso-tentorial surface of the occipital lobe; while others (Ferrier) have included not only the occipital lobe, but also extend the visual area into the temporo-parietal lobes." With Henschen he believes "that the centre for the macula lutea in the primary visual cortex is situated in the more anterior portion of the calcarine fissure, that is, toward the apex of the cuneus. That tentatively it may be assumed that a horizontal strip of the retina is represented in the posterior part of the calcarine fissure." He bases these conclusions upon cases of hemianopsia in which there is a lesion of the middle portion of the calcarine fissure and cuneus, in which the anterior and posterior portions have not been involved.

The location of the lesion usually determines the variety. Should the crossed fibres of the chiasm be the seat of invasion both nasal retinal fields will be affected and as a result bitemporal hemianopsia will be present. The hemianopsia is usually preceded by contraction of the peripheral portion of the temporal side for colors, then for form and light sense, and later bitemporal blindness is complete. In these cases central acuteness of vision is nearly always impaired. Both eyes may be attacked at the same time or one may precede the other.

Nasal hemianopsia is rather an anomalous condition, and from the very nature of the lesion, or rather lesions, is rare. It implies lesions of both temporal bundles of nerves for binasal hemianopsia at the lateral angles of the chiasm. In a case of binasal hemianopsia occurring in the course of tabetic atrophy, reported by Heed and Price, of Philadelphia, the view is taken that "nasal hemianopsia cannot result from such lesion," and they quote the conclusions of William T. Shoemaker from the investigation of numerous authorities "as proving that the uncrossed fibres are at no point in the chiasm found as an isolated bundle." Quoting farther from this paper they say, "That in a majority of instances the symptom results from more or less symmetrical lesions of the optic nerves is shown by an analysis of the cases recorded. Shoemaker, in 1905, collected eighteen cases of binasal hemianopsia, to which he added one of his own. Since then we

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have found but one case reported, that of Coppez, which with our case would make twenty-one. Of this series in three neuro-retinitis was present; in two traumatic atrophy; two were optic neuritis associated with brain tumor; two were tabetic optic atrophy; two chronic interstitial optic neuritis; two secondary optic atrophy; one primary optic atrophy, and one traumatic optic neuritis."

The most common form of hemianopsia is homonymous, and is due to some lesion along the visual path between the chiasm and the visual cortex. This lesion may be in the occipital lobe, cortical or sub-cortical, or both; it may be in the posterior third of the posterior limb of the internal capsule; in the primary optic ganglia; or it may be in the optic tract. When the lesion involves the whole visual cortex lateral homonymous hemianopsia of the opposite side is complete. While in lesions both of the cortical visual centre and of the visual tract there is homonymous hemianopsia, in the former the patient is not conscious of the loss of vision, the symptom being negative—the "vision nulle" of Dufour, while in lesion of the optic radiations there is a sensation of darkness or blackness. Cases are recorded in which negative vision was present in lesion of the optic radiations, so that this differentiation is not always dependable. The localization of certain retinal areas in certain areas in the visual centres seems to have been definitely settled in the minds of some investigators, but by others these statements are not accepted. Those of the former class base their belief upon those cases of disease of the cortex in which quadrant and sector hemianopsia and cases of ring-like or other scotoma are present in the visual field. It is also assumed that the macula is represented by a distinct portion of the visual centre, and that it is situated in the more anterior portion of the calcarine fissure. The fact that in some cases of hemianopsia the line of division between the blind and the seeing halves of the visual field passes through the centre of vision, while in other cases this line bends out at the visual centre as if a piece were bitten out, makes the assumption of any specific area in the cortex for the macular fibres difficult to explain. This becomes even more difficult to understand in those cases of double hemianopsia. In some of these the blind area is noticed at the macula while in others it is not. In double hemianopsia, either coincident or consecutive, there is in many of the cases central vision,

the so-called "barrel" vision, in which the portion of the cortex corresponding with the macula is not involved in the lesion. No explanation has been made as to why, in some cases, the lesion should destroy the entire half vision centre while in others a portion of the field is not affected; and why, even if this is the case, in lateral homonymous hemianopsia of one-half the lesion affecting the other half should involve the periphery of this half, leaving the centre intact, the involvement of the two sides being exactly alike. It has been suggested that the blood-supply to the macular portion of the visual centre is greater than for the other parts, and as a result maintains its function. Another explanation is that the centre of vision for each retina is connected with both visual centres, but this does not explain why in some cases half blindness is complete and in others there is the notch at the macula. Other theories are advanced but thus far no one theory clears up the situation satisfactorily.

Lesions of the cortex do not always cause complete hemianopsia but only partial visual defects of portions of the field, generally more peripherally, or there may be loss of the color-sense in the affected side (hemichromatopsia), the form and light sense not being involved, or the reverse may be true. That there are separate centres for light, form and color is maintained by some but the generally accepted view now is that there are not separate centres for them.

A lesion of the tract is differentiated from that of the cortical area by Wernicke's "hemianoptic pupil symptom," in which by throwing a pencil of light on the amaurotic eye the pupil reacts to light if the lesion is back of the geniculate bodies; if anterior to these bodies no reaction takes place.

Hemianopsia is, as has been pointed out, due to a lesion in some portion of the optic tract. In hemorrhage into the cortical visual area the cortex and subcortex and later the inner membranes are involved. They may be followed by hemiplegias or other manifestations of central pressure, which may be transient or permanent, but the hemianopsia almost invariably remains permanent. Tumors almost always involve both the cortex and subcortex. Abscesses, thrombi, emboli, injuries, periostitis, tuberculous masses, and meningeal inflammations may cause hemianopsia, and these may be anywhere in the course of the optic tract. In a paper presented by Dr. J. Ramsey Hunt before

the American Neurological Association, on "Paralytic and Other Persistent Sequelæ of Migraine," he says: "In a vast majority of cases a tendency to migraine entails no more serious consequences than the recurrence of periodic headaches of varying degree of severity. Headaches of this character are often associated with curious transitory focal symptoms, as scotoma, hemianopsia, hemiparesis and hemiparesthesia. These focal manifestations are purely functional in nature and disappear promptly with the subsidence of the other symptoms of the paroxysms. These temporary hemianopsias have been observed by others and particularly as associated with migraine."

Hemianopsia is generally a symptom of some grave central lesion, for which unfortunately little can be done, but it does point to the character of the trouble and enables us to advise properly against the dangers incident to these lesions.

So much of the matter covered in dealing with this subject must necessarily be the result of painstaking investigation that the writer makes no claims to originality in the conclusions brought out, but acknowledges to drawing largely from the splendid articles of Dr. Charles K. Mills, "The Psychology of the Visual Act and the Focal Diseases of the Visual Cortex;" Posey and Spiller, "The Eye and the Nervous System;" of Dr. Henry Swanzy, "Eye Diseases and Eye-Symptoms in Their Relation to Organic Diseases of the Brain and Spinal Cord;" "System of the Diseases of the Eye," Norris and Oliver, and also to frequent reference to Fuch's Ophthalmology, to Ball's Modern Ophthalmology, Pederson's Diseases of the Nervous System, and others.

229 Majestic Building.

1. Binasal Hemianopsia Occurring In The Course Of Tabetic Atrophy, Charles R. Heed, M. D., and George E. Price. *Jour. A. M. A.*, Vol. LXII, p. 771.

2. Paper before American Neurological Association, Paralytic and Other Persistent Sequelæ of Migraine. *Jour. A. M. A.*, June 12, 1915, p. 2012.

OCULIST VERSUS OPTICIAN.*

FRED. D. LEWIS, M. D.,

Buffalo, N. Y.

“**A**NNUAL EXAMINATIONS.—The Buffalo Department of Health strongly advises every person over thirty years of age to submit to an annual examination by his physician to determine his physical condition. Many persons have their teeth or their eyes examined at regular intervals, either as a matter of protection or necessity, but overlook other important defects until compelled to seek a physician's advice. If the service of teeth can be prolonged and the eyesight saved by proper remedial measures, it is reasonable to assume that the same may be done with the entire body. Numerous persons never knew they had any organic defects until they were rejected for life insurance, either as a result of urinalysis or a general physical examination. The Chinese have not progressed far in medicine, but they pay their doctors to keep them well rather than to cure them when they are sick.”

The above was taken from the Buffalo Sanitary Bulletin, August 31, 1915, and says a great deal in few words. Something like this I advised about ten years ago in a paper read before the American Institute of Homœopathy. I, however, emphasized the importance of an examination of the eyes in that connection. I was led to select this subject by having a man of about sixty years come to me for eye-examination with a history of rapid loss of sight. I could not help him with a careful refraction, but the ophthalmoscope revealed a condition of the retina suggestive of kidney disease and in a very advanced stage. His physician made an examination and found Bright's disease beyond help. In other words, his death-warrant was written in his eye.

With your permission, Gentlemen, I am going to report just a few cases before taking up the subject of the evening. It will give us a point of view from which to form judgment.

*Read before the Clinical Club of Buffalo, Nov. 29, 1915.

Mrs. M. was referred to me in March, 1914. She reported that she had been treated for some years by one of our best known skin specialists for a red nose. The treatment was by the electric needle; the cause, as stated by her doctor, was intestinal indigestion. For this she was treated by a careful prescriber but was not cured. He suspected the eyes might enter into her trouble and referred her to me for a refraction.

I found she had a high degree of crossed astigmatism in the right eye with a smaller amount of hyperopic astigmatism with hyperopia in the left, and with unsymmetrical angles. Under correction with proper lens, intestinal trouble disappeared; nose became normal in color with no further treatment. She presented herself at my office July last because of some recurrence of her indigestion. A slight change of glasses was found necessary and all was right again.

Mr. E. came to me first in 1907, having what appeared to be a simple inflammation of the right eye. I gave him local treatment but also refracted him before dismissal. I found he has astigmatism in each eye, but more in the right, and I ordered glasses for constant wear. Nothing further was heard of him until August of this year, when he returned again with an inflammation of the right eye. In the meantime he had become presbyopic and two months previous to his return to me he had been refracted by an optician. The glasses he had received were practically plain glasses with patches. My examination showed the astigmatism much as before, so I corrected with cylinders for distance with patches. No trouble since.

Cases might be quoted along these lines indefinitely but I will stop with just one more. This man, when referred to me, had been treated for three months for indigestion without relief. Correction of eye-strain resulted in such immediate relief that in about two weeks he brought his wife to me, with the remark that he did not know that she had any eye-trouble but he wanted to find out.

Now, with some slight idea of how much the use of our eyes influences our general physical condition and our enjoyment or otherwise of life, is it safe to trust such an important function to the care of an optician? a man who should be thoroughly capable of manufacturing optical goods, but should he be allowed to decide what the eyes are in need of? Why not just as naturally expect the instrument-

maker to operate your cases, or the druggist to prescribe, or the builder to erect your home without an architect's plans?

I saw a statement recently that I thought very good. It said, no one is capable of properly treating any particular portion of the body without having a knowledge of the working of all of the body. There was a law passed in this state some years ago permitting opticians to prescribe glasses. I felt at the time it was a very wrong thing to do, but it was passed, and I now think that we, as physicians, should warn our patients of the dangers they run in trusting to opticians for the correction of eye-troubles.

A friend of mine who is in the advertising business told me a few days ago of an ad he had prepared for a drug store. It read: "It is dangerous for any one to make his own diagnosis. See your family physician and come to us to get your prescription filled." This should apply just as strongly to the optician as to the druggist.

In a talk that I gave before the Rotary Club of Buffalo something over a year ago, I said that of all the senses we possess the sense of sight is the most used and the most abused. We give more attention to our teeth than we do to our eyes, and the eyes are of infinitely more importance. The sense of sight is used every minute that we are awake, and if there is a slight defect in the eyes, the effort to overcome this, although slight, when extended over our waking hours results in the loss of an enormous amount of nerve-energy. This loss may be so great that other functions of the body may be deprived of sufficient nerve-energy to perform their functions properly, so that very serious results may follow an uncorrected eyestrain. And it is a curious fact, at first glance, that it is the small amount of eye-trouble that causes the greatest amount of general disturbance. I am often asked why this is. It is easily understood when we consider that a small amount of astigmatism, hyperopia, muscle-imbalance, etc., can be and is easily overcome, however with the loss of nerve-energy referred to previously. On the other hand, the amount of trouble may be so great that it cannot be overcome, the effort required being too great, and consequently there is no general nerve-disturbance, but the patient has to be satisfied with less vision. Now when we realize that a refraction is of the greatest importance where the trouble is slight, is it not a natural conclusion that justice is done only to the patient, when the

eyes especially are the cause of symptoms, by examination by one who first of all has the degree of doctor, and second has made a special study of the eyes?

When I refer to the talk I gave the Rotary Club I have to smile at an incident. The Secretary in sending out the notices gave me the title of oculist with two C.'s. This being a new title to me I endeavored to find its meaning. Referring to the dictionary I concluded it could have reference only to occult, which means beyond the power of the eye to see, so I concluded the Secretary considered my business to be out of sight.

Exophthalmic Goitre.—"Dr. H. L. Galloway reports [where] immediate improvement and eventually a practical cure in a case of exophthalmic goitre by the subcutaneous injection of pituitrin, 15 minims daily, continued for forty days."—*Critic and Guide*.

Ink stains, it is said, may be removed with ammonium binoxalate.

The cause of leprosy, it has been proven, is the bacillus of Hansen, which abounds in the nasal secretions as well as in the skin lesions. Infection can take place through the skin by blood-sucking insects.

Adrenalin chlorid solution 1 to 1000 deteriorates from exposure to air and changes color. So long as the color is not deeper than pink the loss of activity is practically negligible. When red the solution may be 10 per cent. or 20 per cent. weakened. When brown, with brown sediment, throw it away, although even then it may have some activity.

SOME NEW FACTS OF INTEREST TO THE GENERAL PRACTITIONER.

HENRY L. GOWENS, JR., M. D.,

Philadelphia.

SANTOS FERNANDEZ found that of 1,785 cases of iritis, 54.79 per cent. were due to syphilis.

Harman, in a study of the cause of blindness in 1,100 children, found that 54 per cent. was due to venereal diseases, 24 per cent. to ophthalmia neonatorum and 34 per cent. to inherited syphilis.

Lowenstein has found that cases of hereditary lues in which the Wassermann test was negative reacted positively to luetin.

Klausner states that pallidin is only positive in gummatous and late hereditary lues.

McAdams has been able to find in the literature over 100 cases of complete blindness following the use of atoxyl, another arsenic derivative which for some time was much vaunted for the treatment of syphilis. His report of seven cases of serious eye-complications following very late after the injection of salvarsan and not any of these cases responding to the usual antisyphilitic treatment, and his claim that there is a tendency for such affections to appear less frequently, due to more energetic treatment with salvarsan, is borne out by—

Terrien and Prelat, who found four cases of ocular complications and a paralysis of the auditory nerve appearing simultaneously—or at an interval of a few days, in the secondary stage, and a short time after the injection of salvarsan. They prepared a tabular statement of twenty-one cases of ocular accidents after the use of salvarsan, reported in the literature, from which it appears that these complications arise in general quite late after the use of the drug. While they do not deny the influence of salvarsan in the pathogenesis of these accidents, yet in most cases they are syphilitic disturbances which supervene in spite of the use of salvarsan.

Terlinck observed that the recurrence of iritis follows a few days

after the injection of salvarsan, while the recurrence of neuritis follows several weeks or months afterward.

Fradkine found that by giving salvarsan to cases of interstitial keratitis having excessive vascularization, the blepharospasm, photophobia and vascularization were more favorably influenced than by any other drug. No benefit was derived in the non-vascular cases of keratitis. Uhle and MacKinney also observed the same results.

Uththoff summarizes his experiences as regards the eye-symptoms present in general paralysis of the insane. The percentages of the principal conditions were as follows: Optic atrophy, 8; optic neuritis, 2; Argyll-Robertson pupil, 44; sluggish reaction of the pupils to light, 16; anisocoria, 22; miosis, 25; well-marked irregularity of pupils, 25, and paralysis of the ocular muscles, 10. In only 5 per cent. of all cases of progressive optic atrophy has he failed sooner or later to detect signs of either tabes or general paralysis. He regards progressive optic atrophy as being always a sign of one of these two diseases. Cases which remain stationary or unilateral are to be suspected of being secondary to basal syphilis or retrobulbar neuritic process.

Von Hippel advises that surgical procedures in ocular tuberculosis should be postponed as long as possible. He would undertake the extraction of a secondary cataract only when a tuberculous eye had been free from irritation for two years. In the presence of glaucomatous rise of tension in these cases, if the use of myotics does not suffice, he considers Elliot's trephining less dangerous than iridectomy, as being an operation of less magnitude and not so likely to occasion scattering of the tubercle bacilli. Among seventy-five cases of tuberculosis of the iris and ciliary body, relapses occurred in fifteen, and at intervals of from three months to three years after the end of the first course of treatment. A long interval must therefore elapse before one is justified in regarding uveal tuberculosis as definitely cured.

Curtin reports that many phlyctenular cases were cured following the use of the von Pirquet test alone.

Intermediate necropsy findings are reported by Verhoeff from a case in which death was due to tuberculosis of the hypophysis. The ocular history and clinical picture were perfectly characteristic of chronic ocular tuberculosis; and this, together with the complete de-

struction of the hypophysis, which was the sole cause of death, was apparently due to a small conglomerate tubercle at the base of the right lung. The general symptoms included cessation of the menses eight months before death, polyuria and polydipsia, and marked mental dulness. The literature appears to contain only eight reports of cases of hypophysial tuberculosis. In Verhoeff's case the ocular disease, which was definitely known to be of three years' duration, included lesions of the cornea, iris, filtration angle, ciliary body and sclera. The choroid and retina were free from tubercles. The fact that there was no active clinical evidence of scleritis, although microscopic examination showed numerous active foci in the anterior part of each eye, suggests that scleritis may often exist without characteristic clinical manifestations, especially when in association with tuberculous keratitis. Verhoeff regards it as manifest that the ocular lesions in this case bore out his contention that chronic ocular tuberculosis takes place from the aqueous humor.

In the case of retinal detachment reported by von Hippel as due to tuberculosis, the right eye was enucleated in a state of phthisis following vitreous hemorrhage. The enucleated eye was found full of tuberculous masses, yet a general reaction to old tuberculin was only obtained at the sixth injection, of 5 mg. strength. Tuberculin therapy was entirely without result on the detachment. In a second case demonstrated by the same writer, the eye was enucleated on account of a condition which had been diagnosed as inflammatory glaucoma. In the cornea the microscopic picture was that of parenchymatous keratitis of tuberculous character, and accumulation of epithelioid and large giant cells were also found in the sclerocorneal trabeculum and in the anterior part of the ciliary body. In the case reported by Jocs and Dulcos, a penetrating injury of the cornea was followed by the development of tuberculosis involving the cornea, the angle of the anterior chamber, the iris, and the ciliary body.

Luedde believes that tuberculous infection of the eye occurs by way of the nasal accessory sinuses, to which presumably the germs are carried in the act of coughing.

Bates describes some cases to illustrate his contention that eye-strain, by producing dissipation of nerve-force, may cause tuberculosis.

Thompson's paper describes three cases in which ocular disturbances appeared to have been due to disease of the vermiform appendix. In the first instance permanent relief from a severe uveitis was not obtained until a large adherent appendix had been removed. In this case, however, the peritoneum was pronounced tuberculous. In the second patient there was only slight tenderness over the appendix, but removal of that structure was followed by cure of the uveitis. In the third case the patient became free from recurrent attacks of accommodative paralysis after an operation for appendicitis.

Elschnig's paper, as to the significance of affections of the nasal accessory sinuses in ocular pathology, deals particularly with disturbances of the optic nerve. Of sixteen unilateral cases, three were retrobulbar neuritis, the ophthalmoscopic appearance being normal. In nine cases there were only slight changes in the disc, whereas in four there was pronounced papilledema. In seven instances the pupil of the diseased eye was dilated without loss of reaction. The visual acuity was almost reduced to blindness in ten, and only slightly disturbed in three cases, and in three patients there was an absolute central scotoma. Of fifteen treated cases only four did not recover, all of which had shown severe disturbance of vision.

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SURGICAL AND CLINICAL NOTES.

Dr. De Wayne Hallett, New York, in peeling down the conjunctiva preparatory to splitting the layers of the cornea in for the corneoscleral trephine operation for glaucoma, has frequently observed quite sizable bloodvessels still remaining on the scleral surface, passing forward and ending in loops at the corneal margin. These loops being cut by the first splitting incision cause an annoying bleeding, which interferes with a clear view and makes frequent sponging necessary, with the incidental delay. By cutting this vessel some 4 mm. back from the cornea, the field for corneal splitting is largely freed from blood.

Dr. Hallett reports the case of a caddy who lost an eye from the effects of the effects of the fluid of a liquid-core golf-ball. This fluid squirted into the eye when the boy, out of curiosity, peeled off the several layers of rubber down to the rubber sac holding the liquid.

An hour elapsed before securing medical attention. The entire cornea sloughed, and eight months later was covered by a thick yellowish, fleshy and slightly vascular scar, but without symblepharon. Vision is limited to an indefinite location of light.

SCOPOLAMINE IN WEAK SOLUTION OVER LONG PERIOD OF TIME.

In the case of Mr. J. H. S., who presented himself in 1903 seeking some improvement of vision, and who was then seventy-one years of age, an examination under mydriasis disclosed for each eye marked nuclear cataracts and a myopia of twelve and thirteen diopters.

He had retired from active life and seemed quite satisfied with such improvement as was afforded by the prescribed lenses, together with the benefits secured by the mydriasis.

In the course of several visits it was found that a sufficient effect to last through one day was secured by the use of a drop of scopolamin hydrobromate, 1-10,000, instilled in each eye in the morning, and this treatment has been continued, with an intermission of but a few days now and then, for twelve years.

At the present writing such a drop gives him a pupil inactive to light, and of $4\frac{1}{2}$ mm. diameter.

When a drop is omitted for a day the pupils return to normal size and react normally.

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DE WAYNE HALLET, M. D.

Dr. Gerhard H. Cocks, of New York, gives a very complete original communication in the September *Laryngscope*, entitled **Experimental Studies of the Effect of Various Atmospheric Conditions upon the Upper Respiratory Tract**, and says in concluding the paper:

"Our clinical experiments demonstrate that distinct changes in the mucous membranes of the nose result from changes of air temperature and humidity. In the majority of instances the reaction is one of increased swelling, moisture and redness from heat, and the reverse from cold.

The effect of air blown directly upon the face by fans greatly modifies the changes observed. On going from the cold to the hot room with fans, there is a decrease in the size of the inferior turbinate and in the amount of moisture. The characteristic change on passing from the hot to the cold condition with fans, is an increase in the turbinates and secretion.

"It was further observed that moist heat produces greater changes than dry heat, while the highest percentage of cases of atrophic rhinitis was found among long-time workers in hot, moist rooms (steam laundries)."

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Ueber die spezifische Optochintherapie der Pneumokokken Infektionen der Hornhaut, ein Klinische bakteriologische und experimentelle Studie. Dr. von Cavara, Universität Siena.—*Klin. Monats. f. Augenheilk*, June, 1915.

We are indebted to Morgenroth and his assistants for our scientific and practical knowledge and proof of a chemotherapy between pneumococcic infection and optochin or ethylhydrokuprein, a derivative of Chinins C_2H_5O . Morgenroth and R. Levy studied at first the prophylactic and therapeutic action of these alkaloids on mice, which were given intraperitoneal injections of virulent pneumococci. The therapeutic agent was injected subcutaneously with an aqueous solution of optochin. Of ninety-six mice which were treated, 26 per cent. overcame the infection; 74 per cent. outlived the control-mice, which died within twenty-four hours. The greatest interval for a favorable result was five to six hours between the infection and the beginning of the treatment. These results were confirmed by Neufeld, Engwer, Boehncke. A. E. Wright next took up the study of optochin in the reagent-glass. Wright made a comparative study of different substances in normal salt-solutions (optochin-lysol-kresol-guialol) in regard to their bacteriological action against the pneumococci. Wright found that in normal salt-solutions of 1:800,000, optochin killed pneumococci, but it had very little influence on the culture-growths of the staphylococci and no bacteriological influence on the paratyphoid B. Therefore, from the laboratory standpoint, the possibility of a bacteriological infection being healed by a definite chemical agent was proven for the first time.

From the clinical standpoint, Leber was the first to report concerning the action of optochin at the Heidelberg Congress, 1913. At the International Medical Congress in London, 1913, Sattler reported favorably his experience with optochin. He made hourly instillations of 1 per cent. optochin solution into the conjunctival sac. A host of writers reported their experiences (Steindorff, Dervier, Kuhnt, Kümmeil, Neunhöffer, Wiener, Gradle, Distler, Dimitry, Kandiba, Natan-

son, Axenfeld, Plocker, Stengele, Fryre, Schleich, etc.). The object of the experiments described by v. Cavara was to try optochin in an unusual number of cases. At the Siena Eye Clinic the statistics show that of 9 per cent. of all eye-cases are *ulcus serpens*. The author treated fifty-five cases.

This article is a masterpiece. It comprises eighty pages, and should be read by all of us. Of great interest to us is the fact that the use of optochin is being therapeutically tried out in some American clinics. I was agreeably surprised to note that Dr. Webster Fox speaks favorably of it. I have translated the "Zusammenfassung" of this article for the profession.

F. O. N.

ZUSAMMENFASSUNG.

TRANSLATED BY FRANK O. NAGLE.

(1) Optochin shows a prominent elective action against the pneumococci. The remaining bacteria which come into consideration in *ulcus serpens* are less influenced by optochin than the pneumococci. The Morax-Axenfeld bacillus is influenced next to the pneumococci. Then follow the staphylococcus aureus, streptococci, Friedlander's bacillus and bacterium coli. The bacillus pyocyanus is wholly uninfluenced by optochin.

(2) Optochin impedes in cultures the development of pneumococci in a dilution of 1:500,000. On the other hand, the culture growths of diplobacilli are impeded through a dilution of 1:10,000, whereas the culture growths of the staphylococci and streptococci are affected in a dilution of 1:5,000, and finally, the cultural growth of the Friedlander bacillus and the bacterium coli require a concentration of 1:1,000, and 1:800, respectively. The bacillus pyocyanus grows in solutions of 1 per cent. optochin hydrochlorid.

(3) One per cent. solutions of optochin hydrochlorid, which are the solutions mostly used, are borne well by the cornea and conjunctiva even with repeated instillations. Experimental examinations on rabbits' eyes have shown that solutions of optochin hydrochlorid 1:1,000 or even 1:500 are harmless to the iris and other structures of the anterior chamber. Stronger solutions irritate and cause infiltrations into the cornea and finally produce whitish discoloration of the iris.

(4) One per cent. solutions of optochin hydrochlorid cause a slight anesthesia of the cornea.

(5) One per cent. solutions of optochin hydrochlorid disturb in no way the healing process of the cornea, whether deep or superficial.

(6) In a single instillation of optochin one per cent. solution into the conjunctival sac, no influence is exerted upon the pupil, but with repeated instillations a light mydriasis occurs. One or frequent instillations have no influence on the tension. At the most a slight hypotonus is present.

(7) Optochin is a specific remedy for the pneumococci of the cornea. It has an extraordinarily favorable influence on their growth. The other corneal ulcers which are caused by various bacteria are scarcely influenced therapeutically by optochin.

(8) Superficial pneumococcic ulcers, even if they are diffuse, are quickly healed by hourly instillations of optochin hydrochlorid. Deeper infiltrations heal more slowly and stubbornly, and at times it happens that the corneal infiltration in the deeper layers remains while the superficial epithelium above is intact, as shown by the fluorescence reaction.

(9) With the use of optochin one never observes a progression of the ulcerative progress in the superficial layers. On the contrary, a progression of the deep corneal infiltration may take place, which at times may lead on to perforation. One can count upon this occurrence in six to eight per cent. of the cases. After corneal perforation has taken place there is no contra-indication against continuing the use of this specific treatment, since the iris has a remarkable tolerance against optochin.

(10) The accompanying symptoms of Serpiginous Ulcer, especially the iritis, are favorably influenced by optochin. At times a severe iritis remains, whereas the ulcer has cleared up, and less frequently the iritis continues in a sub-acute stage for a long time.

(11) An increase in tension is no contra-indication to optochin, inasmuch as experimentally, a hypotonus is produced by long continued application.

(12) Because of the great tolerance of the cornea for optochin, this remedy may be used in the stage where a keratocele is present.

The optochin is recommended as the one specific agent throughout Ulcer Serpens. Acute exacerbations are positively prevented.

(13) The presence of Dacryocystitis also has no unfavorable influence upon the ulcer when treated with optochin. Extirpation of the lacrimal sac, therefore, can be postponed until the ulcer is completely healed.

(14) The mucopurulent secretion of the lacrimal sac under the influence of optochin changes its character and is diminished. The secretion from the lacrimal sac becomes clearer, and often only shows itself by evidence of the increased lacrimation. In many cases the later condition even disappears. Systematic bacteriological examinations have shown that during the treatment of ulcer serpens with optochin, the pneumococci gradually disappear from the lacrimal sac. This disappearance may be definite. In many cases it is, however, only transient, inasmuch as sooner or later the pneumococci reappear after the discontinuation of optochin.

(15) The cornea, which remains after specific treatment, has the great advantage that its extent is never so great as the original ulcer. Usually the scar is made smaller by the re-absorption of the peripheral borders of the ulcer. The permanent scar again is thin and produces a light degree of astigmatism.

(16) As a result of the former statement, the vision with specific treatment is much better than with other methods of treatment.

(17) The specific treatment overbids the cauterization method by the fact that we have quicker results.

(18) The study of the results obtained leads von Cavara to the conclusion that optochin occupies an important place in the treatment of ulcus serpens. The almost instantaneous regression of the progress, the relative quick healing, which is combined with the least damage to the vision, places before us results which recommend optochin. In contra-distinction to cauterization, optochin does not disturb normal corneal tissue. Finally, because of its practicability, optochin can be readily used by the general practitioner.

Implantation of a Piece of Costal Cartilage to Obtain a Mobile Support for the Artificial Eye.—Carlotti and Bailleul in *Annales d'Ocu-*

listique, "Decembre, 1914." This issue was received December 7, 1915, with announcement that regular publication of the *Annales* will be resumed with the January, 1916, number. Congratulations to that Journal, with admiration for the wonderful recuperation that France is demonstrating.

Despite antisepsis, notably iodine tincture, enucleation of the eye is still requisite in two cases: (1) When the eye infected by a small wound or a foreign body is attacked with total phthisis, local pains, headache and—as we noted in one case—with pain in the eye; (2) when the trauma has completely disorganized the globe and infected the tissues.

Three successful and very satisfactory cases are reported of this new operation.

1st step.—A ten centimeter incision over the ninth costal cartilage. Excision of a piece one-and-a-half centimeters long. The piece of cartilage is enveloped in (*revetue*) its perichondrium which will serve for fixation of the ocular muscles.

2nd step.—Enucleation, taking care to seize the conjunctival sac with four forceps, and also before cutting each rectus to secure it with a suture (gut) passed twice through its mass about a centimeter beyond its insertion. Upon enucleation tampon lightly to check the hemorrhage little by little—not too roughly.

3d step.—Dissect a strip of skin from the upper lid. The first incision from the middle of the brow just below and parallel to it to a centimeter outside of the external commissure. The second incision, about a centimeter below and parallel is prolonged externally a little below the commissure; at their inner extremity these incisions are united in a curve, making a tongue-shaped flap which is dissected from subjacent tissues. A tunnel is made from its pedicle to the interior of the ocular cavity and through this the flap is passed, the lid wound being united with an intradermal suture.

4th step.—The cartilage is fastened with four sutures to the buried end of the skin-flap so that its anterior, superficial face is covered with the skin.

5th step.—The muscles are then stitched to this block of skin and cartilage corresponding to their normal implantation.

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6th step.—The conjunctival culs-de-sac are stitched and the conjunctiva covers the block exactly, just as after resection of the anterior segment of the globe.—J. L. M.

The retinal arterial pulse is physiological, concludes de Speyr (*Ann. d'Ocul.*, December, 1914), and not limited to glaucoma or aortic insufficiency. He observed it in 88.5 per cent. of the normal individuals examined; his method of study could be used only in young people because (almost) only in them is the normal reflection of the retina visible.—J. L. M.

The oculocardiac reflex (Aschner, 1908) can arouse stuporous, anesthetized and unconscious patients. In narcosis this reflex persists longer than the corneal and pupillary reflexes. Thumb-pressure of about 30 mm. of mercury, through the lid, under the brow, not directly on the cornea, is usually kept up for six or seven seconds; it *slows the pulse and makes the respiration more shallow*.

This is a simple and safe method of obtaining reflex vagus inhibition of the heart, which is more profound and more frequently obtained than by pressure over the vagus nerves. Right ocular pressure has a slightly greater effect on the heart-rate than has left; left ocular pressure has a greater effect on the conduction mechanism of the heart than the right. It may lengthen auriculo-ventricular conduction and cause partial heart block.

The afferent pulse of this reflex passes through the trigeminal nerve and the efferent through the vagus.

It is generally absent in tabes dorsalis, was absent in one case of diabetes mellitus and in one of auricular fibrillation (but present in the latter after digitalis). Atropin, 0.02 mg. subcutaneously, abolished the reflex for one to three hours. It is often absent in syphilitic disease of the nervous system; was wanting in fifteen out of sixteen cases of Parkinson's disease.

Mougeot and Loepe believe that in general this reflex is maintained in tachycardias and in bradycardias of nervous origin, while it is lost in those due to myocardial disease. It is usually exaggerated in Graves' disease. Is present in chronic valvular disease, and pneumonia.—S. A. Levine, *Arch. of Int. Med.*, May 15, 1915.—J. L. M.

The Absorption of Drugs From the Nasal Submucosa of Dogs.—

When epinephrin is injected into the submucosa of the anterior turbinals or of the septum, the absorption is usually very rapid, occasionally approximating that of an intravenous injection. (J. D. Pilcher, *J. A. M. A.*, July 17, 1915). Alkaloids, potassium iodid, nitroglycerine etc., also are usually rapidly absorbed. A few, however, were rather slowly absorbed, but the difference depends, in all probability, not so much on the nature of the drug as on the experimental difficulties of introducing the drug into like parts of the submucosa.

Dogs were employed under morphin-ether anesthesia. Most of the drugs used have a marked action on the blood pressure, so that this was taken as an indication of the absorption of the drug; the pressure was taken from the carotid artery. The presence of the drug in the urine indicated the absorption in the case of potassium iodid and methylene blue. The drugs were injected into the submucosa of the anterior turbinals or less frequently into the septum from a glass-barrel syringe. The quantity injected was usually from about 0.5 to 1 c.c.; this small amount tended to prevent over-distention of the tissues, and the escape of the injected fluid. As with epinephrin, it was found that generally the absorption was more rapid when the solution was introduced under considerable pressure although there were numerous exceptions to this statement. The dogs differed considerably in the number of successful results.

The absorption took place equally well at low or at higher levels of blood pressure, from 60 to 160 mm.; thus, the greatest reaction with the nitrites occurred at the low level of 60 mm. on the injection of 5 mg. per kilogram of sodium nitrite, the pressure falling from 60 to 28 mm. It was found that epinephrin passed into the circulation at even lower pressure.—*Med. Rev. of Rev.*—J. L. M.

The Abuse of Surgery in Diseases of the Ear, Nose and Throat.—

"Whatever may be their professions before a medical society, it is the practice of many otologists and pediatricians to incise every ear-drum in the presence of pain and congestion, or even pain and a slight elevation of temperature, without delay or careful observation." Virginius Dabney (*Med. Rev. of Rev.*, Nov., 1915) knows such men, who say

it can do no harm and may do some good. "Of course this first statement is untrue and needs no refutation."

"In the entire field of surgery perhaps no operation is so often misapplied as the removal of the faucial tonsil, not excepting the much-wronged appendix." It is presumptuous, an indication of a small mind, to assert that the appendix or any other part of the normal body has no function simply because we as yet do not know its part in the economy of the system, and that therefore "it is as well or better out than in."

As Dr. Dabney says, "There is but one safe, rational method for determining the condition of the tonsil: the history of the case as supplied by the internist and by the family or patient; second in importance comes inspection" [and *palpitation*—J. L. M.] "of the gland, which may show little or much even when most diseased." He has "heard a laryngologist of reputation say that he always removed the tonsils when he removed the adenoids, even if they appeared healthy, because in his experience it became necessary subsequently to do so;" *i. e.*, advocated removal of healthy organs because they might some day become diseased. "Even granting that they would," says Dabney—but he does not admit this to be the invariable rule, "what of the period of health intervening, when they aided in the protection of the body against bacterial invasion?" "Mere enlargement is no reason for removal." (A prominent New York laryngo-rhinologist a few years ago—whatever his present practice—was in the habit of removing a tonsil "if it was large enough to be seen.")—J. L. M.

Dr. Dabney relates the case of a "child brought to a laryngologist for examination of the tonsils shortly after an attack of acute follicular tonsillitis, while the glands were still somewhat enlarged. Without asking any questions as to recent disease, but only taking a brief look at the throat, he at once urged the immediate removal of the tonsils. However, when the parents finally yielded, and two weeks later the child was etherized and placed on the table, to the astonishment of the eager operator the tonsils were found not only perfectly healthy, but so far recovered from inspection that the anterior pillar had to be drawn forward and a seizing forceps inserted into the space to draw the tonsil forward into view. I regret to add that the innocent organs were lacerated, however, and the parents still believe that the child's

tonsils were diseased and were removed. Another colleague, observing that a mother was reluctant even to discuss an operation, exclaimed, on seeing the boy's throat: 'Ye gods, what tonsils!' The spectacular diagnosis and fervor of his remark apparently convinced her, though the mythological invocation might well have excited the suspicion that his interest was somewhat out of proportion to the proper scientific point of view. Two years later this boy died of endocarditis, with pericarditis ushering in the fever, and it is interesting to conjecture whether the absence of the tonsils had any bearing on the lack of resistance to the disease, or, more pertinent still, if the tonsils had not been removed would not some one of the attendants have said that a previous removal would have prevented the fatal illness, the endocarditis with which tonsillar disease is apparently often associated?"

He has "personal knowledge of one operator" who urged tonsillec-tomy to improve the hearing in a case of oto-sclerosis (otospongiosis) of classical type!

"Some explanation and defense" is called for of the great number of operations from deflected nasal septa in cases that give no symptoms pointing unmistakably to the septum. Dr. Dabney knows of the situation where of two rhinologists with a practice the same size, and the same training and skill, one will do fifty submucous resections in a season when the other is doing ten or fifteen in the same time. This disparity *could* be accounted for by the lust for operation.

A patient of Dr. D. was advised to have his septum straightened by a rhinologist in another town, a traumatic deviation which for fifty years had never caused any symptoms possibly referable to the nose; "he had had only two or three colds since manhood and his ears were perfect."

The mastoid operation is the only one in this field, writes Dr. Dabney, that is not consciously abused. "Of course we all occasionally do what might prove to be an unnecessary operation, but the mistake is merely one of over-caution."

"He is a callous rhinologist who to-day removes the inferior turbinates."—J. L. M.

The Combined Excision for Cicatricial Trachoma.—James H. Andrew (*L. I. M. J.*, Nov., 1915) presented two cases that he had

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operated: (1) Age 23, trachoma for eight years. Much photophobia with mechanical ptosis; numerous superficial corneal ulcers in both eyes and pannus commencing. Four weeks after the combined (Heisrath-Kuhnt) excision on both eyes he was back at work, ulcers healed and pannus gone. (2) Age 27, trachoma for fifteen years; had the expression operation performed four times. Right eye was cured but the left grew worse. Three months ago he was unable to work because of pain and photophobia. Marked pannus and a fairly deep ulcer. Combined excision; two weeks after leaving the hospital he had gone to work again. Ulcer has healed (a slight macula) and pannus disappeared.

The combined operation is applicable, according to Beard:

1st. To all chronic forms of trachoma with characteristic follicles combined with infiltration of the tarsus, whether the cornea is involved or not.

2nd. In trachoma of the fornices and palpebral conjunctiva independent of the condition of the tarsus, if the cornea is involved or about to be.

3d. In gelatinous trachoma, if the convex edge of the tarsus shows typical thickening.

4th. In cured trachoma of the fornices if there is a secondary infection of the cornea.

Contra-indications:

1st. It is not advisable to operate in the early stages of trachoma when less radical measures will suffice.

2nd. Never do the combined excision in the stage of complete cicatrization with obliteration of the retrotarsal fold. (That calls for Kuhnt's tarsal resection.)

Pannus and corneal ulcers are positive indications for operation. By operating not later than the beginning of corneal involvement many eyes may be saved.—J. L. M.

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HOSPITALS AND THE LAW. By EDWIN VALENTINE MITCHELL, LL. B., of the Law Faculty, University of South Dakota, author of "The Doctor in Court." Linen, 8°, 178 pages. 7¾x5x⅞". New York, Rebman Co., 1915.

A handy little book, written in such pleasant style as to be very easy reading, of interest and quite possibly of value to any physician or surgeon interested in or practicing only in a hospital. The profuse citations of cases might be helpful to the counsel for a hospital; these are at the foot of most of the pages and also are arranged in an alphabetical table supplemental to a thorough general index. The seven chapters are devoted to Preliminary Considerations, Rights and Responsibilities, Officials and Attendants, Administration and Regulation, Foundation and Organization, Remuneration and Support, Military and Naval Hospitals.

A paying patient sued the Massachusetts Homœopathic Hospital for negligence of a nurse and lost the case. The court held that the payment by the patients "commonly * * * does not make full pecuniary compensation for the services rendered. * * * That such hospital in its treatment of a rich patient shall be held to a greater degree of care than in its treatment of a pauper is not to be tolerated; * * * the degree of protection from unskilled and careless nurses must be the same in both cases."

In another case an insane patient committed suicide while alone in a room; pay was received for constant attendance of a guard. That court denied damages, holding that "the contract was to keep constant watch and ward," but not to prevent the patient committing suicide. "Nor could it be fairly held to be within the reasonable intendment of this contract that the hospital agreed to pay to the husband the value of his wife's life to him in case she did commit suicide. A charity hospital incurs no liability for negligence of the nurse, due care having been exercised in her selection, because money accepted from patients able to pay did not go to persons who were trustees, directors, founders or incorporators of the institution, and was not a

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source of pecuniary gain to private individuals but was devoted to the general purposes of charity." And because it would be a diversion of trust funds to pay out in damages moneys given to establish or maintain a charity.

A hospital, however, is liable if it is conducted with a view to making profit, no matter if it does do some charitable work.

If a physician operates for profit one of his patients in an unincorporated institution he is personally liable for negligence of nurses that he employs, but not for that of nurses over whom he has no authority.

—J. L. M.

PRACTICE OF MEDICINE. By Walter Sands Mills, A. B., M. D., Professor of Medicine, New York Homœopathic Medical College and Flower Hospital. The book contains 705 pages, including a complete index of 50 pages. Boericke & Tafel, Philadelphia, 1915. Buckram. Gilt top. \$5.00, net.

The book is written both for students and physicians. It is concisely written and well arranged, and is particularly adapted to students in homœopathic colleges since it contains a list of homœopathic remedies together with the indications that are useful in the treatment of every one of the disease conditions which the author considers. It is well worth the cost to one who invests in the book. It deserves a large sale.—Ed.

LABORATORY METHODS. WITH SPECIAL REFERENCE TO THE NEEDS OF THE GENERAL PRACTITIONER. By Williams and Williams, with an Introduction by Victor C. Vaughan. Third edition. Illustrated with 43 engravings. C. V. Mosby Company, St. Louis. 1915. Price, \$2.50, net.

It is claimed for the book that it "is not of encyclopedic form, nor is it a limited compend, and is especially designed for the general practitioner who desires to make, easily and inexpensively, examinations on which he may depend." It has been the aim of the authors to simplify methods both as to apparatus and technic, in both of which they have ably succeeded. This third edition has been enlarged to include elastic tissue staining, salting out method for tubercle bacilli, a simple Gram stain, an invaluable blood stain, a dressing

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for laboratory tables and a number of other features. The book is what its title claims for it, "Laboratory Methods. With Special Reference to the Needs of the General Practitioner." Every progressive general practitioner is in need of just such a book.—Ed.

DISEASES OF THE SKIN. By Henry H. Hazen, A. B., M. D., Professor of Dermatology, Medical Department of the Georgetown University; Professor of Dermatology, Medical Department of Howard University. 233 illustrations, including four colored plates. 539 pages. Published by the C. V. Mosby Company, St. Louis. 1915.

Dr. Hazen has presented the profession with another book on diseases of the skin. As you look through it you are pleased to admit that in the main it is an excellent one. It is entertainingly written and in a style that should be easily comprehended by the student and general practitioner, for whom it is especially intended. The definitions and descriptions while concise are clear, and are given with sufficient ease to make interesting reading.

In regard to the etiology of the various diseases, the latest known facts are given; in other words, it has been the author's desire to bring the book up to date throughout. The doctor lays special stress upon the pathology and histopathology, claiming that without a knowledge of these one cannot understand dermatology; although true, this interests more particularly the advanced student or specialist. The aid the general practitioner seeks is clear, concise definition, with illustrations galore; with such a "picture book" before him he will grasp the differentiations quickly and be enabled to diagnose his cases more accurately. In his illustrations the author has been generous and as a rule they are very good.

Dr. Hazen's experience among the negroes has been extensive. It has given him an unusual advantage in differentiation of lesions; this is not only interesting but it will be helpful to those in similar lines of work.

His classification and arrangement of diseases is good and probably will be helpful to the student, although it looks strange to see eczema placed among diseases "probably due to external infections;" that some cases are is likely to be true, but to so classify eczema is equivalent to asserting that all are. This rather leaves one with the

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impression that the author is inclined to be dogmatic. For instance, a case of vesicular eczema which may be healed in a few weeks by a change of diet alone must be either not eczema, or the above classification needs some modifications.

In reference to psoriasis, the writer apparently inclines to the belief that change of environment has more to do with a patient's improvement than change of diet. Schamberg has conclusively shown that all psoriatics are proportionally retainers of nitrogen. Of course this was demonstrated in the hospital where all food was carefully weighed, and it was surprising to observe that in many cases the eruption could be played upon at will by change of food. On the other hand, with patients treated in the out-patient department, or even at home, it was next to impossible to judge accurately of the ingestion of nitrogenous food.

All in all, probably the best article in the book is that upon syphilis; it is quite comprehensive in text, describing well the present recognized methods of treatment, and is particularly favored with illustrations.

Someone has laid down the rule that if two-thirds of our efforts succeed we should write down well done; if such a standard be recognized, Dr. Hazen is to be congratulated. The book is worthy of perusal and will doubtless be a valuable aid to those for whom he wrote it.—PERCY EALER.

NEWS AND NOTES.

An Association for the Advancement of Applied Optics was recently organized at Rochester, New York. Its membership will include general physicists, laboratory experts in optical problems and instruments, illuminating engineers and oculists. The advantage and need of co-operation of men in these allied professions have often been suggested, for there are many practical problems relating to the welfare of human vision that can best be solved by united efforts. Therefore, it is to be hoped that the future of the Association will fulfill the aim expressed in its constitution, "to increase and diffuse the knowledge of Optics, to promote the mutual interest of investigators of optical instruments and apparatus of all kinds and to encourage co-operation among them."

It is but natural that such an association should have its origin at Rochester, New York, as it is the great optical center of this country. The officers of the Association are as follows: Pres., P. G. Nutting, Ph. D.; 1st Vice-Pres., Herman Kellner, Ph. D.; 2nd Vice-Pres., Prof. Howard D. Minchin, Ph. D.; Treas., Adolph Lomb; Rec. Sec'y, Lloyd A. Jones, M. A.; Cor. Sec'y, Frank E. Ross, Ph. D.; Council, Elmer J. Bissell, M. D., W. B. Rayton, C. W. Frederick, F. B. Saegmüller.

Dr. William F. Beggs, of Newark, N. J., has removed his office to the Aldine Building, corner Lombardy and Broad Street.

Dr. George W. Mackenzie read a paper on "The Diagnosis of Acute Maxillary Sinusitis" before the New York Medical Society at their regular meeting, January 24th.

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Editorial

THE EFFECTS OF ALCOHOL ON THE EFFICIENCY OF MILITARY MEN.

UNDER the above title there appeared an article in the February number of the *Medical Times* written by Colonel L. M. Maus, U. S. A. Medical Corps. Colonel Maus claims that "In order to attain success in war as well as in other walks of professional life the individual must preserve his general health, which is the keynote to efficiency and success, and from an experience of over forty years as an army medical officer I know of no factor which contributes more to the general health and efficiency than total abstinence.

"Apart from its bearing on the health and preservation of the human race, temperance has become a cold-blooded business proposition, which is assuming great importance in the commercial world. Professional and business men everywhere have learned that the drink habit unfits men for the ordinary pursuits of life."

Colonel Maus calls attention to the many experiments that have been made by military men and others to determine the effects of alcohol on mental and physical efficiency. "During one of General Wolseley's campaigns he divided some of his men into squads for marching experiments. The first squad was given a daily ration of whiskey, the second a ration of beer and the third water. At first the whiskey squad marched gaily ahead, but was soon overtaken by the beer squad, which in turn was passed by the water squad. The water squad followed an even gait, and after passing both whiskey and beer squads, reached its destination long before its competitors.

"Lord Kitchener allowed his men no spirits whatever during his campaign in the Soudan. Lord Roberts was equally firm in encouraging abstinence from alcohol. Dr. Wahlberg, Engineer-in-chief of

the Finnish army during 1877-8, said that non-drinkers endured better and that old drinkers were the first men to break down.

"The Boers, whose endurance was generally commented upon favorably, used neither spirits nor beer. Sir Frederick Treves, who served at Ladysmith, says that the drinking men fell out and dropped as regularly as if they were labeled with the big letter 'D' on their backs."

Colonel Maus in this same article cites experiments by Exner, of Vienna, Voit, Shumberg and Schäffer; the studies of Metchnikoff, Masset, Bordel and others, all of which prove what he has found, that—

I. As a beverage it (alcohol) lowers all the mental faculties, such as judgment, memory, perception, thought, comparison, caution and quickness of action.

II. It lessens working capacity, marching endurance, accuracy and rapidity in rifle firing, ability to command troops or navigate ships, to act as members of military courts or boards, or to perform the higher administrative duties of military life.

III. It causes sickness, impairs health and usefulness, adds greatly to the non-efficiency of officers and men, increases the burden of the medical department in times of peace and war, deprives the government frequently of the services of those who drink and increases unnecessarily the retired and pension lists of the army and navy.

IV. It lowers the moral standard, lessens self-restraint and is productive of unreliability, untruthfulness, dishonesty and crime.

In view of all the facts set forth by Colonel Maus in his excellent article and verified by the investigations of others, it is high time that some united efforts be attempted by the moralist to point out the evils of alcohol from the moral viewpoint, the economist from the economical and the physician from the medical.

Every physician to be qualified to practice medicine should be as familiar with the subject of alcohol and its effects on the body and mind as he is supposed to be with any other subject of corresponding importance. Furthermore, any physician who through ignorance or otherwise permits his patients to use alcohol as a beverage without pointing out the risk his patient is taking, falls short of his duty as much as the physician who would permit a healthy child to visit the home of another infected with a contagious disease.

THE GALVANIC TEST IN THE DIAGNOSIS OF INNER EAR AND VIII NERVE LESIONS.

After an experience of ten years with the various labyrinthine tests the Editor has arrived at the conclusion that the galvanic test is by far the most satisfactory of them all.

It has to recommend it:

- (1) That it is the easiest to apply.
- (2) That it produces the least amount of discomfort to the patient during the examination.
- (3) That it is not followed by any prolonged ill effects as is the case with the turning and caloric tests.
- (4) That it gives the most consistent findings, especially when compared to the findings of Barany in his after-turning tests.
- (5) That it is the most sensitive and therefore the most accurate of the labyrinthine tests.
- (6) That it is both a qualitative and quantitative test.
- (7) That it is the only test by which we are able to differentiate inner ear from VIII nerve lesions.
- (8) That it is the most satisfactory test for noting retrogression or improvement in VIII nerve neuritis.

The test is not as popular in this country as it might have been if it had the stamp of approval of certain Viennese authorities, although one of them would like to have the credit for having originated and perfected the test.

The Editor because of his most satisfactory experience with the galvanic tests feels justified in recommending it to the otological profession to be used wherever there is need for testing the function of the inner ear or nerve; furthermore, no examination of these parts is complete without it.

SHALL MEDICAL EDITORS HAVE A RIGHT TO PUBLISH ARTICLES PERTAINING TO THE PUBLIC HEALTH?

At the last annual meeting of the American Medical Editors' Association in New York, October 19, 1915, the following resolutions were adopted:

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RESOLUTIONS.

WHEREAS, The American Medical Editors' Association believe that the principle of the freedom of the press bears unusual force in relation to the medical press, discussing subjects germane to medical progress, and

WHEREAS, The *Southern California Practitioner* has been indicted by the United States Postal Department because of the publication of an article dealing with the "sex question" which appeared in the issue of March, 1914.

Be it Resolved, That the American Medical Editors' Association express to Dr. George E. Malsbary, Editor of the *Southern California Practitioner*, its confidence and moral support in the pending action.

Be it Resolved, That the American Medical Editors' Association assure Dr. Malsbary of its willingness and readiness to afford him any assistance and support within its power according to the Constitution and By-Laws.

IRA S. WILE,
C. W. FASSETT,
HENRY R. HARROWER,
Committee.

DR. WILLIAM LINCOLN BALLENGER.

Dr. Ballenger died December 22, 1915, at his boyhood home on the "Blue Sky Farm," Economy, Indiana.

Dr. Ballenger will be missed by his many friends. He will be remembered by those who knew him best as a man of genial disposition, making friends wherever he went; a diligent student who never tired of his work; original in thought, always inventing something in the way of new instruments or improving upon the method of operation; progressive in mind; eagerly looking up the newest thought; radical in his methods, but withal liberal to those who would oppose them.

Among the many things which he accomplished may be mentioned the invention of the swivel knife, popularly used for removal of cartilage in submucous operation on the septum; invention of the ethmoid knives for radical removal of the ethmoids, and according to Joseph

C. Beck, "the popularization of the Sluder operation for the removal of tonsils was unquestionably due to Dr. Ballenger."

He gave the profession an excellent treatise on oto-laryngology which, judging from its sale, must be acknowledged to be the most popular of its kind. Aside from this he was a liberal contributor to the literature of his specialty. He was ever ready to read or discuss a paper pertaining to his subject.

Dr. Ballenger was "Professor of Otology at the Chicago Eye and Ear College, 1895; lecturer, 1898; assistant professor, 1901; associate professor, 1902. Professor of Otology and Laryngology from 1905 until 1913 Medical Department, University of Illinois."

"He served as Secretary of the American Academy of Ophthalmology and Oto-Laryngology in 1899-1902, was its President in 1902-1903 and since then Councillor. Was a Fellow of the International Otological Congress; member of the Chicago Medical Society; Chicago Laryngological and Otological Society; American Laryngological Association; American Laryngological, Rhinological and Otological Association (Vice-President in 1905); Illinois State Medical Society and the American Medical Association. Was also a fellow in the American College of Surgeons."

In 1886 Dr. Ballenger married Miss Ada Poarch, of Richmond, Indiana.

THOMAS SHEARER, M. D.

In the death of Dr. Thomas Shearer of Baltimore, on the 18th of February, Homœopathy loses one of its oldest and most successful practitioners. He was in his 91st year. His death was due to a fall.

Dr. Shearer was born August 1, 1825, at Stonehouse, Lanarkshire, Scotland. He received a classical education, graduating with honors from the University of Glasgow in his eighteenth year. On account of a change in his religious opinions he gave up the idea of entering the Presbyterian ministry, toward which his education had been directed, and abandoning the study of theology he took up that of medicine. After practicing three years he came to America—in 1848. Becoming interested in Homœopathy he attended lectures at the Homœopathic College of Pennsylvania and was graduated in 1858, after which he went to Charleston, S. C., and engaged in his chosen

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work until near the close of the Civil War. Since that time he has resided in Baltimore, where he practiced his profession until a few years ago.

One who was closely associated with Dr. Shearer through many years of professional work says of him: "He possessed the most keen diagnostic ability, a wonderful knowledge of materia medica, a gentle sympathetic manner in the sick room which endeared him to his patients. He was one of the fast disappearing old general practitioners, one of the pioneers who fought the great battle with ancient methods of enormous dosage and shot-gun prescribing so much in vogue forty years ago."

Dr. Shearer was a gentleman of cultivated tastes and fine discrimination in matters of art and literature.

In 1856 he married Miss Harriett Josephine Fox, daughter of George Fox, of Pennsylvania. He is survived by his widow and daughter, Miss Mary B. Shearer, and a son, Dr. Thomas L. Shearer, one of the collaborators of the JOURNAL.

ANNOUNCEMENT.

Dr. Burton Haseltine, of Chicago, will act as associate editor for the April number of the JOURNAL. Dr. Haseltine's originality will be no less manifested in the coming issue than it was in the issue of January, 1915.

A CORRECTION.

A note received from Dr. G. A. Suffa calls attention to an error in his article in the February JOURNAL. Referring to the figure—beginning with the last word of the last line on page 138, instead of "The eyes are rotated to the right," it should read "The eyes are looking straight ahead."—ED.

SOME FATAL EAR CASES IN THE WRITER'S PRACTICE DURING THE PAST YEAR.

OTIS D. STICKNEY, M. D.,

Atlantic City, N. J.

CASE 1. R. L.—Female, six years of age. Family history unimportant.

A. D. began to discharge over two years ago; at that time had a severe sore throat; ear has been discharging ever since.

On June 14, 1915, she was brought to my office, complaining of severe pain in the right mastoid, which was much worse at night. The child looked ill, had a temperature of 103° F., and a pulse of 135. There was edema and tenderness of the mastoid, with some redness; the infra-auricular region was also somewhat swollen and tender.

On wiping away the profuse, foul-smelling, yellowish discharge from the canal, a large granulation was seen projecting through a large posterior perforation of the membrana tympani. The other ear was normal. The child has been under treatment for several weeks by the family physician.

On June 15 a radical mastoid operation was performed, just before which the temperature was 104° F., pulse 120, respiration 36. After removing the mastoid cortex the cellular structure was found to be entirely broken down; the resulting cavity was filled with putrid smelling pus; the antral and attic region was occupied by a cholesteatoma. There was no accidental exposure of the dura. After all the pathologic material had been removed, and the bony part of the radical operation completed, a plastic was done according to the method of Koerner. On finishing this, a small drop of pus was seen over the knee of the lateral sinus. The pus was wiped away and the area curetted on the supposition that a small cell had been overlooked. No fistula could be made out although it was looked for under the illumination of a Klaar electric headlight. In view of the after course of the case I am now convinced that the small drop of pus came through a minute fistula in the bone, and that if it was from a peri-sinus abscess. The bony wound was lightly packed with iodoform gauze and the

incision was sutured, excepting at its inferior angle, where a small drain was inserted.

After the operation the patient was quite cyanotic for several hours. Her temperature fell to 99° F. On the following day the swelling in the infra-auricular region had increased; with it there was redness and tenderness, and a rise in temperature to 102.8°. On incising this swelling several drams of pus were evacuated.

During the next few days the child developed a cough, which was attributed to the irritation of the anæsthetic; her temperature ranged from 98° to 103°; respiration 28 to 44. She was very restless and cried out during her sleep. She also passed five or six round worms.

On June 23, eight days after the operation, an examination of the pus from the neck and ear was reported upon as follows: "No bacterial growth in pus from neck; that from the ear contained staphylococcus albus and a Gram negative small bacillus, probably the bacillus influenzae." The urine contained a heavy cloud of albumen. Microscopically, there was no pus, blood casts or crystals. The blood examination—"leucocytes 26,000, with a percentage of 72 polynuclear cells and 20 per cent. lymphocytes."

The unfavorable condition of the patient was ascribed by the general physicians in the case to a pathologic process in her lungs of a broncho-pneumonia type; to the intestinal parasites, and to the surgical procedures on her ear and neck.

From the otologist's viewpoint I now felt almost convinced that the child had an extra-dural abscess or sinus thrombosis. The discharge from the ear and wound had been more profuse than was expected. I explained to the parents of the child and to the general physician that I thought she would certainly die unless her head was opened again.

A well-known surgeon was then called in consultation. He advised against further operative procedures on the ground that he thought they were unnecessary, and that as far as the child's ear and mastoid were concerned she simply had a large wound there with insufficient vitality to heal it. On the supposition that the child was of a scrofulous diathesis, he suggested inunctions of Unguentum Hydrargyrum.

While I was personally strongly in favor of an exploratory operation I realized that the pulmonary condition almost contra-indicated it.

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This was one of the reasons why the general physicians had been opposed to further operative interference almost from the very beginning. I now felt that the child positively had at least an extradural abscess, and probably sinus thrombosis, and that the latter was producing some of the pulmonary changes. From June 30 until July 3 her respirations varied from 40 to 100, pulse from 120 to 172, and temperature from 99.4° to 105° .

The child's mind remained clear until the end. Several days before her death she complained of pain in the chest. Exitus lethalis occurred on July 7.

Permission was obtained for an incomplete autopsy. A large peri-sinus abscess was found. The dura of the sinus and in the region of the tegmen mastoideum was thickened and covered with a yellowish membrane. Pus was found within the sinus. The lungs showed multiple septic foci in various stages of degeneration, there being a number of abscesses, several approximating the size of an English walnut, two of which had reached the surface of the lung and discharged into the pleural cavity.

In reflecting upon this case I feel that I should have insisted more strongly on an early secondary exploratory operation. The temperature, high leucocyte count, amount of discharge from the wound and the generally unfavorable condition of the patient should have been sufficient reasons for exposing the dura of the middle and posterior fossæ. If this had been done and the lungs had withstood the anæsthetic, I think the child could have been saved.

CASE 2. S. J.—Male, age 15 years. Family history unimportant.

Four years prior to present illness had an acute suppurative otitis media of the left ear of ten weeks' duration. This was treated by the family physician and no paracentesis had been performed. Since then on an average of four times a year there had been periods of aural discharge which lasted three or four days; once it was noticed that this had a very foul odor. During most of this time the ear had felt uncomfortable. The boy wiped his ear out almost daily, and the mother said that she usually cleaned it out twice a week with cotton on an applicator.

Two years ago had typhoid fever which lasted eight weeks, after which his general health had been better than heretofore. He had never been a strong boy, although he was six feet tall at the age of

fifteen. He became easily fatigued, and for the past year had had severe frontal headache, worse over the left eye. His refraction for O_2 was $+ 0.50$ sph. = 0.50 cyl. ax. 90.

The present illness dated from March 28, when he contracted an acute coryza with pain over the right antrum of Highmore and in the left ear. On the following day his ear began to discharge profusely, but despite the discharge the pain in the ear was very severe and continued so for several days. The aural discharge lasted for about a week, during most of which time his temperature was from 103° to 104° . Then the discharge stopped for three or four days, at the end of which time it began again and was immediately very profuse, yellow and stringy. From now on he had constant pain in the left frontal region, which was so severe that he was unable to sleep. This pain was his principal complaint when I was first called to see him, on April 20, more than three weeks after the apparent beginning of his present illness.

At this time there was a profuse muco-purulent discharge; he was tender over the mastoid and there was sagging of the posterior-superior wall of the osseous canal. His temperature was 101° F. He appeared very ill; had an expression of dread on his face and was greatly prostrated. In the hope that if the aural discharge had freer egress his condition might change for the better, a free incision was made in the membrana tympani. Eight hours later his condition was unimproved. He still complained of severe general headache, which was most intense in the region of the left frontal eminence. There was no tenderness on pressure over either frontal sinus and no pus in the middle nasal meati. His temperature was 101.4° , and he was very restless. On account of his severe headache I thought of the possibility of a beginning meningitis, and advised that his mastoid be opened immediately. The indications for operation were general mastoid tenderness with slight swelling; sagging of the posterior-superior wall of the osseous auditory canal; profuse purulent discharge at the beginning of the fourth week which was not diminishing; fever of moderate degree; restlessness; prostration; headache, and the general ill appearance of the patient.

Consent for the operation having been obtained the patient was removed to the hospital, and a simple mastoid operation was immediately performed.

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The cells were more or less broken down and contained pus, and the antrum was filled with granulations. The tegmen antri was examined with a small blunt probe in search of a possible bony fistula communicating with the dura of the middle fossa. However no such absence of bone was detected. During the operation the lateral sinus was exposed over an area of about 4 mm. in diameter. The color of the dura here was more of a reddish hue, and had not the grayish-blue color which one usually expects the normal sinus to present; there were no granulations on it. The bony wound appearing clean, and smooth, several drams of hydrogen peroxide were poured into it, and then this was flushed with hot saline solution. The cavity in the wound was lightly packed with iodoform gauze and sutures were introduced to close the upper half of the incision. The patient passed a fairly comfortable night.

From 8.00 A. M. April 21 to 8.00 A. M. on the 22nd, his temperature was from 99.2° to 100.4° ; pulse 76 to 80; respirations 22 to 24. Patient had a comfortable night and did not complain of pain. About 10.00 A. M. he began to complain of severe pain in right side of head, worse in the frontal region. At 2.00 P. M. he vomited a large quantity of liquid containing curdled milk and undigested food. At this time we hoped that his headache was of gastro-intestinal origin. Earlier in the day he had been given calomel which was followed by a Seidlitz powder. After vomiting and an evacuation of his bowels his headache was relieved. At 4.00 P. M. he felt nauseated, vomited bile, and his headache became severe again. His temperature was 103° , pulse 90, and respirations 26. I did not like the ratio between his temperature and pulse. The relatively slow pulse made me suspicious of beginning increased brain-pressure. He slept well during the night.

On April 23 he complained of nausea and headache, and vomited a small quantity of greenish fluid. In the afternoon he became slightly irrational. In the evening he was troubled with retching, but was not nauseated; his mental condition seemed normal again. There was no pain in the region of the operated mastoid or ear, and his wound was clean. His temperature-range during the day was from 102.6° to 104.2° , pulse 74 to 86, and respirations 22 to 26. You will observe that his pulse rate was slower than the preceding day, although his temperature was somewhat higher.

On April 24 he was somewhat delirious at times and vomited

slightly. At the redressing there was no discharge from the ear or mastoid. There was no complaint of pain around the affected ear. The pain in his head had been mostly in the frontal region and was more severe on the side opposite to the operative field.

At a consultation several of the general physicians and the consultant were opposed to anything further being done in an operative way. Personally, I was in favor of it, although I considered the hope of accomplishing anything a forlorn one. A lumbar puncture performed at this time yielded only three or four drops of fluid, which looked slightly turbid, and later was found to contain streptococci. His temperature-range during the day was from 100° to 103.3° ; pulse 64 to 90; respirations 22 to 36. He was very restless, tossed about a great deal, and talked incessantly.

He had a positive Koernig's sign; his pupils were somewhat dilated, and reacted sluggishly to light. He had rigidity of the neck, and in fact all the symptoms of a fully developed case of acute diffuse suppurative meningitis.

On April 25 his meningeal symptoms were more pronounced, his pupils were dilated and his eyes divergent, and at 10.00 A. M. he lapsed into unconsciousness.

In the afternoon a well-known otologist from our neighboring city was called in consultation. He advised an immediate exploratory operation. This was done—the dura of the middle and posterior fossæ was freely exposed. Beside the increased tension and marked hyperemia of the dura, and the absence of pulsation, nothing was found. On incising the dura the brain tissue immediately prolapsed into the opening. On exploring the temporal lobe no abscess was found.

Exitus lethalis occurred six hours after the operation.

In reflecting upon this case I feel that no mistake was made in its treatment. The exposure of the dura occurs frequently during the performance of the mastoid operation, and is not regarded with apprehension unless a punctured wound is made or the lateral sinus is opened, neither of which accidents occurred in this case. There were certain features in the case which have led me to believe that the boy may possibly have had some chronic intra-cranial condition, such as a brain abscess. The history of a preceding suppurative otitis media of ten weeks' duration, after which there was a slight chronic aural discharge which at times had an offensive odor, together with the state-

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ment that he became easily fatigued and suffered during the past year with constant headache, are symptoms which call to mind the possibility of brain abscess in the latent stage. He also complained of certain ocular symptoms before his final illness. He said, "Doctor, sometimes I see double, and at other times when I look at print the letters are blurred, and I must look at them for several seconds before they become clear." From such a statement trouble in the middle fossa might be inferred, such as an abscess of the temporal lobe, which may have interfered with the function of the third cranial nerve. I am rather inclined to the belief that the traumatism during the operation from the mallet and chisel awakened a latent pathological condition, which became active and resulted in the unfavorable ending.

CASE 3. R. J.—Male, age 25 years. Family and personal history unimportant.

Present trouble began with pain in left ear about three weeks before I first saw him. After enduring the pain for a week or so he had consulted an aurist, who had prescribed syringing with boric acid solution. He visited this physician several times, became dissatisfied, and then attempted to care for the ear himself. His brother says that he noticed that the patient was making mistakes at times on attempting to call people by name.

When I first saw him, on the afternoon of July 15, he complained of pain in his left ear and general headache. His temperature was 104° F. There was tenderness over his mastoid, a profuse mucopurulent discharge, and a drooping of the posterior-superior wall of the osseous auditory canal. Despite the fact that it was a warm summer afternoon he was in bed, covered with a sheet, two blankets and a quilt, and with all the room-windows tightly closed. He denied having had a chill, but said that he had closed the windows and covered up to keep from catching cold. At 8.30 P. M. of the same day his temperature was still 104°. About an hour later he was operated upon. His mastoid was of the diploic variety, with a very dense, thick cortex; it contained practically no cells, excepting the antrum, which contained pus and granulations. The lateral sinus extended far forward, almost touching the posterior wall of the bony canal. In order to open the antrum without injuring the sinus the upper part of the posterior bony wall of the canal had to be removed. In doing this the sinus was ex-

posed over an area of about 5 mm. in diameter. Its color was more reddish than normal but there were no granulations on it.

An hour after the operation the patient's temperature was 105.4° F.—too high a temperature it seemed to me to follow a simple mastoid operation; his respirations were 30, and pulse 136. (Recently I have learned that the patient told his brother that he had a chill in the early morning following the operation.)

On the day after the operation at 11.00 A. M. his temperature was 100.2° F., and at 2.30 P. M. it was 104° F. On the following day his temperature presented about the same fluctuations. Being fearful of sinus thrombosis I removed the stitches which had been placed in the upper half of the incision and inspected the exposed area of sinus under good illumination. There was a pulsation and normal healthy granulations were commencing to form on it. The mastoid wound was very clean and the patient said he felt fine.

On July 17 a blood-count by the hospital pathologist showed a leucocyte count of 7,500, the polynuclear cells being 79 per cent., and the lymphocytes 18 per cent. The blood culture was negative. The result of the blood-examination, together with the presence of apparent pulsation of the sinus and its fairly normal appearance, and the absence of a history of chills, influenced me against making a diagnosis of sinus thrombosis, although his temperature was so suggestive of it.

The next three days his temperature varied from 100.2° to 104° , the exacerbations and remissions being abrupt. Both the patient and nurse were questioned as to whether he had any chills or chilly sensations and the reply was always negative. Apart from slight restlessness and a dull frontal headache he said that he felt fine.

Another blood-count made at this time showed the leucocytes to be 7,000 and the polynuclear cells 60 per cent.

On July 20 urinalysis showed a moderate cloud of albumen, and a ++ Diazo reaction. A "very suggestive Widal" was reported. Hereafter I shall place no credence in such a report—"very suggestive." The low leucocyte count, the "very suggestive Widal," the temperature he was now running of 102° to 104° , with no sudden remissions, the presence of several spots on his abdomen (possibly rose spots), a dull frontal headache, and a tongue somewhat characteristic of typhoid fever, led us to believe that we were probably dealing with a mastoiditis in a typhoid patient.

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He now began to complain of pain in the left leg about three inches below the knee, and a few days later of soreness in the right arm just above the elbow. These areas soon became reddened and swollen. During the next three days his temperature varied from 100° to 103° , and the remissions and rises were abrupt.

On July 27 the swelling in the left leg was incised, and several drams of pus were evacuated. The pus contained streptococci. We still thought it possible that our patient had typhoid fever with abscesses.

On July 30 the leucocyte count was 14,000. The Widal was now negative, and the blood culture was reported negative. During the past three days the temperature varied from 100.8° to 104.6° , and was of a pyemic type.

On July 30 eighty c. c. of antistreptococcic serum were given intravenously. Within eighteen hours his temperature fell suddenly to 98.4° , the lowest it had been since the case was first seen. Within four hours it went to 104° again. His respirations were from 24 to 28 and pulse from 80 to 100.

The patient was always cheerful and hopeful. From August 1 to 6 the temperature remissions were more marked, varying from 99.6° to 105° . Pulse was from 92 to 120 and respirations from 24 to 38. On August 1 an abscess of his right arm above the elbow was incised. On August 6 and 7 abscesses in the left arm and left leg were incised.

From August 7 to 11 his temperature varied from 99.2° to 104.6° , with abrupt rises. His respirations were from 30 to 44 and pulse from 94 to 130. His mental condition was good. There was no discharge from the ear and the wound was clean.

I think that those of us connected with the case now regarded it as pyemia, probably secondary to a sinus thrombosis, which was not discovered at the time of operation. His condition was now such that any operative interference was thought inadvisable.

On August 12 a large abscess in his throat, which seemed to have its origin in the epiglottis, was incised. On the same day he complained of pain in the left side of his chest.

August 12 to 14, his temperature was from 98.4° to 103.8° , pulse 100 to 148, and respirations 28 to 48.

He died on August 14, conscious almost to the end.

No autopsy was obtained but I satisfied myself that he had sinus thrombosis.

I hope that from this case and Case 1 I have learned a lesson; that is, to be more radical, and to do an early secondary operation when the temperature remains high after the first operation. I believe that clinical symptoms should be given precedence over laboratory findings. Of course if they agree our case is so much the stronger.

CASE 4. Miss H.—Age 25 years. About November 1 she developed a rhinitis, pharyngitis and laryngitis. A few days later the right ear became involved; she complained of fullness, tinnitus and deafness. She was treated by her general physician for one week, until the ear became painful, when he referred her to an aurist.

On November 11 he performed a paracentesis and instituted appropriate local treatment. She remained confined to her room.

On November 19 a pathologist reported that the ear discharge contained the staphylococcus aureus.

On November 26 she had a leucocyte count of 10,000, with the polynuclear cells 54 per cent. and the lymphocytes 40 per cent.

Between November 11 and 30 her temperature was normal, excepting on November 16 and 23, when it rose to 100°. During this time there was a profuse muco-purulent discharge, which showed no signs of subsiding; and she complained occasionally of rather severe pain in the ear, and her mastoid was somewhat tender to pressure. Her pulse and respirations were approximately normal.

On November 30 her mastoid was opened. I was a spectator at the operation, she having been under the care of a confrere. The mastoid was of a pneumatic type and contained several very large cells, which macroscopically appeared free from pus or granulations.

The cellular structure of the mastoid was thoroughly cleaned out. Toward the close of the operation I noticed that a probe introduced in the direction of the tegmen of the mastoid and antrum seemed to penetrate a considerable distance. The wound was then lightly packed and the upper angle sutured.

On December 1 the temperature was from 100° to 103.8°. The patient was very nervous and restless and complained of pain in her back and head; she was chilly and vomited. Her pulse was from 100 to 120, respirations 24 to 32.

The girl was of a neurotic type, and this being about her men-

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strual period (at which time she was always extremely nervous) her unfavorable symptoms were ascribed to the period, and the immediate effects of the anæsthesia and operation.

On December 2 her temperature ranged from 101° to 103.4° , respirations 24 to 32, and pulse 116 to 142. She complained bitterly of pain in her lumbar region and head, and was extremely restless. During the night all her symptoms were aggravated.

On December 3, at 8.00 A. M., her temperature was 100° , respirations 32 and pulse 124. She had a positive Koernig's sign. Her mind was still clear; she was complaining of excruciating pain in her head and back, and there was some rigidity of the neck.

At noon her temperature was 99.4° , respirations 32 and pulse 176. Her pupils were dilated and reacted scarcely any to light; her eyes were somewhat divergent, and she had a rotatory nystagmus which was most marked to the right, with wide excursions. She had choked disc and Babinski's sign was present. She was partly conscious. A lumbar puncture yielded cloudy fluid, which was reported to contain pneumococci.

Between 8.00 A. M. and 3.00 P. M. she had grown worse so rapidly that there was no doubt but what she had an acute diffuse suppurative meningitis, which the lumbar puncture confirmed. Her respirations were labored and she had a beginning edema of the lungs.

Thinking it possible that the infecting organisms might have reached the meninges via the route of the oval or round window and internal ear, the affected right ear was irrigated with the saline solution at a temperature of 120° F. This increased the nystagmus to the diseased side. From this I inferred that the infection had not been through one of the windows and the labyrinth, as I believe its function would probably have been promptly destroyed, and that we would not have found the normal caloric reaction. This test was made just before the patient passed into the state of unconsciousness.

Thinking that possibly an extra-dural or peri-sinus abscess might have been overlooked at the first operation, it was decided to do an exploratory operation, although the case was thought hopeless.

When she was removed to the operating room at 4.00 P. M., she was unconscious, had a pulse of 160, and presented the picture of a fully developed case of meningitis. The wound was reopened and more of the upper external wall of the mastoid removed. On inspect-

ing the tegmen mastoideum an opening in the bone was discovered. When this opening was enlarged and the dura was more freely exposed, several dark granulations were seen on the dura at a spot which corresponded in location to the opening in the tegmen. On touching these granulations with a blunt probe the latter went through an opening into the intra-dural space. This probably explained the route taken by the infection and the cause of the meningitis. The dura over the lateral sinus showed no granulations. The dura was red and tense, and on enlarging the opening just mentioned the brain immediately prolapsed into it.

The patient succumbed less than two hours after the operation.

CASE 5. Boy, seven years of age. No previous ear trouble. His mother said that for the past three and one-half years he had a great deal of mucus in his nose and throat. She then gave the following history:

"On April 2, while playing, laid on the damp ground. Two days later began to complain of pain in the right ear; the adjacent region was so sore that he could not bear anyone to touch it. Several days later his mother noticed that the ear was discharging. Immediately his pain ceased. In three or four days he felt much better and went out. At this time he had a profuse muco-purulent discharge. This soreness about the ear of which he had previously complained had disappeared. He had no headache and felt well. His ear discharged for one month, during which time he kept cotton in it. Then it stopped for one week, when he developed a coryza and his ear began to discharge again very profusely, the discharge being thick and purulent. At this time his head began to ache severely on the side of the affected ear. For the next two weeks the discharge was profuse, then he developed a rash which was diagnosed as measles. With the appearance of the rash the discharge from the ear stopped and the pain in his head became intense, especially if he were moved. During the next three or four days he lay very quiet as if prostrated, and had a high fever. He now became somewhat delirious and excitable for a day or so. He had an excessive thirst and then his mother noticed that his jaws were becoming rigid. He then passed into unconsciousness, his pupils were dilated, he was more or less rigid, and had a high fever."

I first saw him at this time. In addition to the above symptoms

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I observed that his pupils did not react to light; that his neck was stiff; he had involuntary urination and defecation; a temperature of 105° . At this first visit an unfavorable prognosis was given to the parents.

The right membrana tympani was grayish red, and looked as it is expected to appear in an acute suppurative otitis media in the clearing up stage. The membrane was incised and a very scanty mucoid discharge followed.

On the following day I was called to see the boy again and found his condition worse than on the preceding day. Although the case was regarded as almost hopeless it was decided to open the mastoid and to expose the dura of the posterior and middle fossa. This was done at 3.00 P. M. The antrum contained granulations but there was no free pus in it or the adjacent cells. The dura was injected and tense. There was no extra-dural abscess and no abscess of the temporal lobe that we could find.

A lumbar puncture performed while the patient was on the operating table yielded cloudy fluid under increased pressure; the infecting micro-organism was the streptococcus.

Death occurred on the following day at 8.00 P. M.

Had this case been under the observation of an aurist from the beginning a timely paracentesis or a simple mastoid operation, performed early, would probably have saved the child's life.

CASE 6: F. J. J.—Male, three months old. First saw case on April 3. The mother said that the child's right ear had been discharging for six weeks. He now had a well marked sub-periosteal mastoid abscess. The superior wall of the canal sagged so that no view of the membrana tympani was possible. His temperature was 101.8° F.

A simple mastoid operation was performed the same day. The mastoid was more or less necrotic and the surrounding bone was somewhat softened. The case ran an uneventful course; in three days the temperature became normal and remained so until the child was removed from the hospital one week later. The subsequent redressings were done in the office. The ear had stopped discharging and the wound healed in three weeks.

I did not see the child again for several weeks, when I was summoned and found him dying of meningitis. The mother said that several days before the baby began crying and had continued to do so in-

cessantly. The family physician had been called in and had prescribed. The next day the baby succumbed with the characteristic symptoms of meningitis. Why the child developed this meningitis after the wound had healed and the ear stopped discharging I do not know. The child's other ear was normal. Unfortunately no bacteriological examination of the pus from the ear or the mastoid abscess was ever made. I am inclined to believe that the meningitis was tubercular. As already mentioned, at the operation after the mastoid had been cleaned out the surrounding bone was all more or less softened. If I had extended the operation until hard bone was found it seemed that a considerable portion of the cranium must have been removed. My understanding is that in tubercular children such is often the case.

CASE 7. H. Q.—Male, 21 years of age. Had always been healthy. During July after diving in a swimming pool he had sensation of water in right ear.

His mother said that about ten days before I first saw him he had complained for several days of severe pain in his right ear. Then this subsided but there was no discharge. After this he had fever and general ill feeling and his family thought he had malaria. He came to the seashore and became worse. The general physician who was now called in was perplexed. Urinalysis showed marked indicanuria. A thorough purging exerted no favorable influence.

I first saw him in consultation on the night of August 11. At this time he was unconscious, very restless, kept tossing himself about the bed, screamed frequently, had involuntary urination and defecation, had rigidity of the neck, mouth and eyes were wide open, his pupils were dilated and irresponsive to light, his temperature was 99°; during the day his pulse had varied from 52 to 100, and respirations from 16 to 20.

The membrana tympani of the ear in which he had previously complained of pain was greyish red and lustreless, and resembled the appearance of the m. t. in an acute suppurative otitis media in the terminal stage. The m. t. of the left ear was normal. On incising the membrane of the right ear there was no discharge.

A lumbar puncture performed at this visit yielded a clear, colorless fluid under about normal pressure; microscopically nothing pathological was found, and the culture was also reported negative. It is possible that the communication between the fourth ventricle and

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the spinal canal may have been blocked, so that while the cerebral fluid may have been infected it was not communicating with the spinal fluid.

Notwithstanding this negative report on the spinal fluid the patient had the classical symptoms of meningitis, and on the following day his condition was worse. His neck and arms were stiff and he had a positive Koernig's sign. His pulse and respirations were irregular and his temperature was rising. His pupils were widely dilated, his optic discs were choked, and he was comatose.

Thinking that an infection of the meninges through the labyrinth might have occurred, I had the patient's right ear irrigated with normal saline solution at a temperature of 120° F. The resident physician, who made the test, reported that there was a conjugate deviation of the eyes to the opposite side. This I believe is the normal reaction in an unconscious patient.

His symptoms being so clearly cerebro-meningeal, and there being an absence of any etiological history other than the severe pain in his right ear for two days in the beginning of his present illness, it was decided to explore the mastoid and adjacent region for a focus of pus. This was immediately done. No pus was found, either in his mastoid or extra-durally. The dura was injected and tense. The right temporal lobe of the brain was entered in several directions, but no pus was found. For five hours after the operation, the patient's temperature continued to rise until it had reached 108° F., when he succumbed. Whether or not this was a meningitis of otitic origin it is difficult to determine. The history of severe pain in his ear for two days in the beginning of his illness gave us the only etiologic clue.

CASE 8. Mrs. B.—Age 35 years. (This case was seen three or four years ago, and does not properly belong to this series, but I am reporting it on account of the rapidity with which it proved fatal.)

The patient was in good health, and went bathing in the ocean on the morning of August 1. During her bath she was knocked down by a wave, and on regaining her feet said that she felt as if water had entered her right ear.

In the afternoon of the same day, the ear began to pain severely, and a general physician was consulted. He prescribed "drops" to be instilled into the ear (Mullein oil, I think), and also gave the indicated remedy. The pain continued severe throughout the rest of the day and night, and on the following day the patient's husband paid a visit

to the doctor's office and further prescribing was done, but the pain continued. The husband told me afterward that they felt that she had an abscess of her ear and that they were waiting for it to "break," when they believed she would be relieved. He said that she had had several such attacks before and that was what had happened.

That night the patient stopped complaining of the pain in her ear and began to almost rave with intense general headache.

At 3.00 P. M. on the following day—about forty-eight hours after the pain in her ear began—I first saw her. She was delirious and had a temperature of 105° F. The membrana tympani was very red and bulging, and on incising it pus came out under much more pressure than is usual. From then until 9.00 P. M. the ear discharged profusely. When I saw her at this time she was unconscious and had an axillary temperature of 107° F. She died one hour later, or about fifty-five hours after she felt the first pain in her ear. What a different story might be related if a paracentesis had been performed the first day!

If the general physicians can ever be convinced of the advisability of having an immediate paracentesis performed in these cases of suspected acute suppurative otitis media, there is no doubt in any of our minds but that most, if not all, of these premature, unnecessary deaths, occurring in cases like these just reported, will be prevented.

THE QUESTION OF AGE IN TONSILLECTOMY.

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IN looking over the history and development of modern medicine one of the most striking features has been the tendency, at different periods, to suddenly direct attention to some particular organ of the human body. A good many years ago, during the transition stage between long-continued local applications for diseases of the pelvic organs and the modern surgical treatment of them, the ovaries came into great prominence. In a very short time these organs were subject to massed attacks of operators—the army of surgeons who specialized in this line of work. After considerable experience in such operations a more conservative spirit was developed, and the ovaries were molested only when absolutely necessary. We are all familiar with the violent yells for help which came from the human appendix, and as soon as the pathologic conditions and treatment were brought clearly to the notice of the medical profession the operation of appendectomy became most popular. While surgical procedure for the relief of inflammatory and suppurative processes in and around the appendix is now firmly established, the tendency here, also, is to be more conservative, and to interfere only in appropriate cases. Notwithstanding the popularity which the ovary and the appendix have enjoyed with the medical profession, they have been clearly out-classed by the more modern tonsil-hunt and its resulting slaughter. There are, of course, a number of reasons for this.

First, the human mouth is so readily opened and so willingly invites an inspection of the parts.

Secondly, the tonsils have been shown to be the portal through which organisms producing many diseases in the human body find their entrance.

Thirdly, the removal of the tonsils—so easily approached through the open mouth—seems to be an operation readily carried out and therefore tempts many men to undertake the procedure who would not do ordinary (surgical) work. Inasmuch as the surgery of the ton-

sils has of late years assumed such tremendous prominence in the prevention and cure of diseases, it occurred to me that it might not be inappropriate on this occasion to consider a point which has a practical bearing upon the subject. I refer to the question of age in reference to tonsillectomy. In other words, is there any definite age in childhood when this operation should not be done and is there any fixed limit during the later years of life when such a procedure is contra-indicated?

In taking up this subject I shall not attempt to discuss tonsillotomy *versus* tonsillectomy, other than to remark that in very young childhood—during the first two or three years of life where one may encounter an enormous hypertrophy of the tonsils—all objects, such as the removal of obstruction to respiration or the establishment of nasal breathing and deglutition, can be obtained by the proper use of the Mackenzie tonsillotome or the guillotine of Matthieu, which remove all of the portion of the tonsil that projects beyond the level of the palatal pillars. It should be a cardinal rule in surgery to avoid as much as possible surgical measures of any kind during the earliest years of childhood, because of the unstable condition of the nerve-centres and the deep effect of shock in such subjects. For these reasons I have always endeavored to avoid performing the more radical operation of tonsillectomy until the child was at least five years old. If any exceptions are to be made to this very arbitrary rule, I would say that should the child be subject to frequent attacks of follicular tonsillitis, with a tendency to enlarged glands in the neck, attacks of bronchitis, of laryngitis, otitis, rheumatic symptoms or the least suggestion of endocardial trouble, a tonsillectomy should be done at once, irrespective of age. In my own practice I have seldom met with cases in which endocarditis was present, but sometimes there come into our hands instances in which the cardiac valves are already damaged. Probably the best indication for the radical removal of tonsils is not merely the recurring attacks of inflammation in them, but the proof that the infection is going deeper by its attacking the second line of defense, as indicated by the more or less constantly enlarged glands in the neck; provided of course that other sources of possible infection, such as the teeth, have been eliminated. Many children are subject to attacks of high temperature, foul breath, upset gastro-intestinal tract, headache, pains in the limbs and loss of flesh. In the vast majority of

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these cases they are examples of an acute infection from the tonsils; in fact, many of the so-called instances of gastric attacks in childhood are really tonsil infections, for there is, strictly speaking, no such disease as gastric fever. From two years of age on to the fourteenth year, the *adenoid* tissue in the pharyngeal vault slowly and gradually develops and in pronounced cases obtains its maximum growth about puberty; but there are occasionally children who during the first year of life are unable to nurse until such adenoid tissue is removed. It is not unusual to find that a moderate enlargement of the faucial tonsils subsides entirely after adenectomy is done. Once you pass the five-year limit in age, tonsil and adenoid work are very frequent up to, say, the twenty-year-of-age period.

Blum,* of San Francisco, has recently been making some interesting investigations concerning the results of tonsillectomy in children. In a series of 100 consecutive cases treated by him in the pediatric service of the San Francisco Polyclinic, tonsillectomy had been performed on twenty-two children. In eighteen cases the operation was done before the end of the eighth year; in three, in the ninth and tenth years; in one at fourteen years of age. In two cases the operations were performed on account of mouth-breathing; in one on account of frequent colds and tonsillar hypertrophy; in one, on account of earache; in one, because of cervical adenitis; in one, for enuresis; in one, without any other cause where a child was referred to the laryngologist to be operated upon for *adhesio linguæ* and in one where adenectomy had been recommended by the attending physician. In eleven cases no reason for operating could be ascertained. Eighteen of these cases had been tonsillectomized before they came under Blum's care; two were operated upon by his advice and two contrary to his advice; the cases were operated upon in various cities of the United States and Blum succeeded in identifying ten different operators. One of these children operated for mouth-breathing developed bronchial asthma one year after the operation. The one operated for frequent colds and hypertrophy came to his clinic one and a half years after the operation still complaining of these colds and earache. The child operated for enuresis on examination was found to have cholecystitis, and the child operated for husky voice still has husky voice, three years after operation. The child who suffered from ear trouble was relieved. Further,

*Laryngoscope, Sept., 1915.

three of the children have asthmatic attacks—in one case beginning one year, in the other two years after tonsillectomy; in four cases ear-ache or an otitis occurred subsequent to the removal of the tonsils.” The investigations of Blum also show that “nine cases had at the time of his examination enlarged cervical glands—evidence that tonsil-enucleation did not prevent the development of adenopathy. Indeed, in one case adenitis developed four weeks after tonsillectomy. In this instance the child had carious teeth—a large diseased molar appearing to be the cause of the enlarged glands. This patient, as well as the one with cholecystitis and enuresis, directs attention to the fact that with the present popularity of tonsillectomy other obvious causes of disease are neglected; from which it is also apparent that enucleation of the tonsils does not always prevent or cure diseases.”

A careful study of the human body has convinced me that there is no portion of it without its function or its uses to the economy. The mere fact that tonsillar and adenoid tissues are present in infancy and childhood; that, as a rule, they attain their maximum size about the age of six to eight years, during the period of primary dentition; the fact that the tonsils become considerably swollen and inflamed during the time of eruption of the teeth—all point to the positive conclusion that they are organs with a function.

The tonsils reach their stage of greatest development usually about the eighth year of childhood and after this period the tendency of these organs is towards atrophy, having served the purpose for which they existed during childhood. Henke made some experiments by injecting charcoal into the gums of animals and man, and subsequently found a large part of the charcoal in their tonsils. Lenart injected charcoal into nasal mucosa of animals and then identifies it in their tonsils. Blum has been injecting insoluble chemicals and bacteria into the *cervical glands* of guinea-pigs and has subsequently recovered the injected matter in their *tonsils* and *oral secretion*. Such a finding would imply that the tonsils are organs of excretion and that they receive and eliminate foreign matter *from* the cervical glands. For some time past it has been held that the current flows from the tonsils to the cervical glands, but certainly Blum's experiments seem to prove that a current under certain conditions also flows from the glands to the tonsils. Carious teeth, dental pus, nasal sinusitis, adenoids, the lingual tonsil, seminal vesicles—all may act as a focus from which general

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systemic poisoning may arise. It is well, therefore, to recognize that while the tonsils may be and often are the lodging house for germs, there is no reason why they should be given the credit of producing such a large proportion of disease.

From the age of twenty years on there are a number of cases which undergo tonsillectomy for constantly recurring quinsy or systemic infections of different types, but when we approach the age of forty to fifty years a most careful study of the local and general conditions should be made before so severe a procedure as tonsillectomy is advised; further, one should be convinced that nothing short of a thorough tonsillectomy will satisfy the conditions.

It is a well known fact that the crypts in the faucial tonsils may be roughly divided into two separate groups, just as in the early embryonic age the tonsil is divided into two portions, the upper and the lower pole.* The crypts in the lower pole run in such a direction towards the pharynx that unless largely covered up by the plica triangularis they drain with a fair amount of readiness into the pharynx; the crypts in the upper pole, however, come at such an angle to the pharynx that the cryptic orifices occupy a higher level than the main part of the tubes. This means that the drainage from the upper pole is evidently against gravity and can easily be delayed or obstructed.

Richardson,† of Washington, reports some cases of arthritis, rheumatism and general ill-health in which the tonsils were removed without any benefit whatever to the patients; and it has been my experience, also, that in many instances encountered in general practice, arthritis once well and clearly established has not shown any improvement after the tonsillectomy. On the other hand, serious sequelæ have at times placed the patient in jeopardy, and I desire to bring to your notice one illustration of this statement.

A lady, sixty years of age; a resident of Baltimore, was told by her own medical adviser that her tonsils were diseased and that they should be removed at once; acting upon this opinion, she had the operation performed thoroughly and skillfully. Within ten days or so after the operation, a cough developed and increased in severity until she expectorated large quantities of dense, heavy secretion, with

*Schoolman, *Laryngoscope*, June, 1915.

†*Laryngoscope*, May, 1915.

elevation of temperature, night sweats and loss of flesh; she complained also of considerable pain antero-posteriorly through the sternal region to the back of the chest; the pain was dull, but severe in type and persistent. The sputum was examined repeatedly for tubercle bacilli and always with negative results, but streptococci in large numbers were present.

Rest in bed, plenty of fresh air and nourishing diet improved her condition somewhat and hypodermics of chlorid of gold with the iodid of manganese diminished the proportion of the dense sputum to the lighter, but did not check it entirely. An examination with the X-ray did not show any foci in the lung tissue or any T. B. areas, but did reveal the presence of an inflammatory process in the mediastinum posteriorly, near the lower part of the lungs. As winter was approaching, I sent her South where she enjoyed all of the advantages of the balmy air and out-of-door life, and while there she had a vaccine administered to her, the culture being obtained from her own sputum. After some months of sojourn in the South, she returned to Baltimore greatly improved, but shortly after suffered a relapse.

There can be no doubt in my mind that this streptococcic bronchitis and mediastinitis were due to absorption of the infection from the tonsils and I also believe—based upon long experience—that her tonsils could have been thoroughly treated and the local infection destroyed by cautery treatment without any such results as followed the tonsillectomy.

It is of the greatest importance, particularly in those tonsils whose crypts yield fetid contents, that local measures be adopted before undertaking a tonsillectomy. Probably the simplest and most effective method is to syringe out as many crypts as possible with a normal salt solution—heated to as hot a degree as can be borne—and for this purpose a Luer glass syringe with a canula-like curved needle-extension sufficiently long to easily reach the tonsil is excellent. The syringe should be of 5 c. c. capacity and the point of the needle should be ground down to a blunt level aperture so as to readily enter the crypts. After the washing out of the crypts, tincture of iodine should be applied on the tip of a cotton-wound, thin applicator and the iodine inserted as deeply as possible into each crypt. Twice a week is often enough for this treatment—for several weeks—if thoroughly carried out. The office atomizer driven by air-pressure is often of no use because the tip of

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the atomizer is clumsy and the point too thick to enter the cryptal mouths. To further increase the efficacy of this treatment a gargle composed of fluid extract of ipecac, $\mathfrak{5i}$; di-oxygen and distilled extract of witch hazel, each $\mathfrak{5ii}$; water to make $\mathfrak{5viii}$,—may be used night and morning.

If, for any reason, a tonsillectomy is not desirable in an adult or if the patient declines operation, we can then use the electro-cautery instead. The method which I employ is as follows: First apply a 4 per cent. solution of novocain on a cotton applicator to the portion of the tonsil to be treated, rubbing the solution gently into the parts. Where the patient retches easily it is best to avoid using the tongue-depressor at this stage and apply the novocain to one spot at a time with fair firm pressure; two or three applications, a minute apart, should be sufficient to deaden the tonsils. Now, with the tongue-depressor held gently in the left hand and pressing lightly upon the tongue, which must be entirely inside the mouth and not protruding beyond the lower teeth, a pointed platinum electrode is drawn gently across the tonsillar tissue, either horizontally or vertically according to the shape of the tonsil, and a series of parallel eschars left. The electrode is best heated to cherry heat—by pressing the little button in the handle—and applied at that degree. The applications should not be severe enough to produce marked pain and each patient will regulate that question promptly. It is of course necessary to avoid burning the palatal pillars or injuring the uvula if it unexpectedly jumps into the way; but one soon becomes expert enough to prevent such an occurrence. I have reduced a number of tonsils with this method, using the cautery once or twice a week according to the toleration of the patient and the requirements; and as the throat becomes accustomed to the treatment and the upper part of the tonsil shrinks, the anterior pillar is held out of the way with a blunt hook in order to permit the application of the electrode to the submerged portion of the tonsil. Once you destroy the tonsillar tissue which contains the diseased crypts and persevere until you have completely destroyed the poisons or organisms which are harbored in the crypts, you obtain exactly the same results as you would after a tonsillectomy, provided the cautery treatment is carried to the requisite degree.

Where there are several large crypts with wide apertures containing the foul-smelling white masses so often encountered on the

tonsil surfaces, it is better after the preliminary cleansing treatment with salt solution and iodine to insert the electrode into the crypt and open it up in all directions. Where there are several of these large crypts they can practically be made to open into a common space, and from that point the rest of the tonsil be reduced. A moderate amount of soreness only should follow this treatment; otherwise the cauterization has been too severe for that patient. I have usually employed this method in older people, anywhere from thirty years of age upwards, and in one instance, a confirmed bleeder, it was the only way to reduce her tonsils with any degree of safety. Should the plica triangularis envelop the tonsil, it does not interfere with this treatment as the fold can easily be destroyed first, thus freeing the crypts, and drainage is immediately established or improved.

And now to come to the practical side of this whole question, I beg to offer the following suggestions as a working basis in the treatment of tonsils:

First, if constitutional and other treatment can successfully maintain a fair condition of health in a child, I think that as a rule tonsillectomy should not be performed under the age of at least eight years.

Second, between the ages of eight and fourteen years if one can obtain positive evidence of local or systemic injury coming from the tonsils and if tonsils do not yield to conservative treatment, enucleation should be carried out.

Third, not infrequently the removal of adenoids may afford such relief to the child as to obviate any immediate necessity for tonsillectomy.

Fourth, the removal of adenoids may be performed at any age when there are urgent indications for it, but should never be done in infants unless the child is unable to nurse on account of the nasal obstruction.

Fifth, it should be made a routine practice in every child suffering from enlarged cervical glands that the teeth, peridental spaces, adenoid region and nasal cavities be thoroughly explored before accusing the faucial tonsil of being the host of the infection.

Sixth, it is also apparent that a tonsillectomy may be imperatively demanded in children under eight years of age whose tonsils are so diseased that they are only a source of danger, and serious systemic

conditions might follow postponement of the operation; in my experience, keeping the nasal passages and the adenoid vault clear during the earlier years of childhood are of vastly more importance than the tonsils.

Seventh, in a very young child whose faucial tonsils are so enlarged as to meet in the centre line—or nearly so—thus obstructing respiration and deglutition, a fair trial of constitutional treatment should be given, but unless the condition shows signs of yielding very promptly a skillful clipping with the tonsillotome will afford immediate relief to the symptoms and produce less shock than tonsillectomy. Enucleation of the tonsils from the fourteenth year well up into advanced adult age is at the present time a frequent procedure, and we may formulate the following general propositions concerning the adult:

1. When one observes in adults, that the tonsils are hypertrophied, the seat of lacunar chronic infections, of superficial or deep latent abscess, the site of frequent acute attacks of simple or follicular tonsillitis; those which are painful in deglutition or tender on pressure or in which there are recurrent attacks of peri-tonsillar abscess, tonsillectomy is certainly indicated and often gives brilliant results. In how old a person can we do this? While it is not easy to be dogmatic in this matter, I should say that it is better to use the cautery method if the patient is over forty-five years of age; and in some instances the patient will refuse surgical intervention, thus forcing us to the cautery—even in patients who are younger than forty years.

2. Tonsillectomy should never be performed in any man or woman suffering from marked arterio-sclerosis with its often accompanying high blood pressure and it is in just such cases that we may encounter arthritis.

3. The power of resistance in a person of fifty years or over is necessarily greatly lessened, with rare exceptions, and should any infection become systemic after a tonsillectomy the result may be very serious.

4. Should malignant disease attack the faucial tonsil there is nothing to do irrespective of age—unless extreme—than to remove it as thoroughly as possible and then depend upon radium radiation to the wound.

5. I should think that as rule it is a mistake to subject any person of fifty years or over to the shock of a tonsillectomy, with its

attendant risks, when you can obtain good results from the careful, thorough use of the electro-cautery; many of the patients who have undergone the operation of tonsillectomy suffer from *annoying dryness* of the *fauces*, in addition to having received no relief from the general infection for which the operation was performed. From this post-operative dryness it is justifiable to infer that one of the functions of the tonsil is to assist in maintaining the proper degree of moisture in the pharynx.

6. I make this statement knowing that the vast majority of men doing throat work do not hesitate to enucleate tonsils—from childhood to advanced age.

7. At the present time, the "Entameba" is the premiere danseuse in the corps de ballet of faucial organisms, and as they are accused not only of hiding in the dental pus pocket but also of lurking in the tonsil crypts, it is not unlikely that while this discovery has been greatly exaggerated it has directed much attention to dental sources of infection. This will take some of the burden from the tonsils if the throat men will only give them a chance. It is further possible that by careful dentistry and the early detection of pyorrheal tendency, arthritis, endocarditis, chorea and other pathological states for which such frequent tonsillectomies are done, may not only be prevented from developing, but the necessity for tonsil enucleation be diminished. This paper is written as a plea for more thorough search for the sources of infection, and with the hope that there will be less tendency on the part of medical men to accuse the tonsil merely because they can not find anything else to account for the symptoms presented by the patient. If, however, any laryngologist is possessed of what Sir Felix Semon, of London, termed, "The lust of operation," it will be easier for him to take out the tonsils and then look elsewhere afterwards—if the symptoms still persist.

AN IMPROVED SUBMUCOUS OPERATION.*

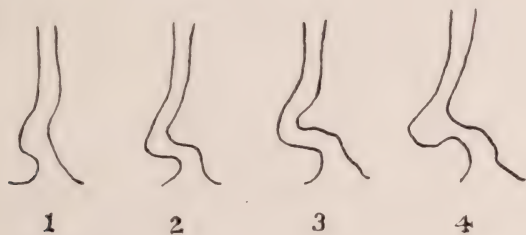
FRANCIS B. KELLOGG, M. D.,

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IN presenting this subject to the society my first title was "An Ideal Submucous Operation." Upon further consideration it was decided that this title might be regarded as savoring of enthusiasm and possibly of unwarranted assumption; hence, the more modest rechristening.

As a preliminary it may be well to state some unsatisfactory features of the accepted submucous resection of the septum as outlined by Freer and Ballenger.

The first is the treatment of the maxillary ridge. This is attacked either with chisel and mallet or is reduced with bone forceps, several patterns of which have been designed for this special purpose. Not only is the removal of this ridge or such part of it as requires removal difficult, but there remains a blunt base which prevents contact between the opposing raw surfaces of the mucous membrane for a certain distance above it, which is not the most favorable condition for a smooth result.



In the writer's experience, while there are certain variations in septal deformities, there is one which occurs with frequency and with more or less regularity. I refer to the posterior septal spur. This occurs so frequently in my practice that I have wondered that so little has been said about it.

Vertical cross sections of the septum from before backward in this

*Presented at the Annual Meeting of the O., O. and L. Society, July 1, 1915.

condition have something of the following outlines, No. 4 being at the extreme rear of the septum.

The difficulty of removing this posterior bony spur with biting forceps is certainly great. The apex of the spur is frequently buried in the soft tissues of the inferior turb, and to get the forceps-blade between the projecting bone and its membranes in order to remove the former and leave the latter is next to impossible. Upon finally succeeding in removing the spur one not infrequently finds that he has broken through the mucous membrane and is working in the open nostril. If this occurs the whole mucous membrane of the convex side seems to melt away leaving the raw surface of the opposite side exposed. So much for the unsatisfactory features* of the Freer operation.

Let us consider for a moment the conditions desirable, if not indispensable, for securing an ideal result. First, the mucous membrane should be intact except at the point of primary incision. Second: Only such part of the cartilago-osseous septum should be removed as is actually redundant or obstructive. Third: The curve of the floor should merge into the normal plane of the septum smoothly and without break. Fourth: The edges of the window should be thin in order that the mucous membrane of the opposite sides may cover them smoothly and meet beyond them in the window without ridges or roughness. All of these conditions follow in the operation I am about to describe, which is as follows:

Primary incision well in front of the deviation on the convex side, from quite high up down to the floor and at least half-way across the latter.

Elevate the membrane *above* the ridge, carrying the separation to the rear of the septum and downward to the edge of the ridge, but not over the edge. *Then* elevate the membrane on the floor of the nose, extend this to the rear and upward to the edge of the ridge. The mucous membrane of the convex side is now free except along the edge of the ridge. In this locality it is thinnest and most adherent. Therefore, in order to avoid tearing it the blades of a delicate pair of scissors are inserted, one above the other below the ridge, and the edge of the same is trimmed off and left attached to the membrane. This applies of course only to the cartilaginous portions of the septum. After this is freed the small Freer separator can be swept over the edge of the bony part, back nearly to the spur, without much danger to the mem-

brane. It is better, however, not to try to separate the membrane from the edge of the spur since it has been loosened above and below it.

Having prepared the membrane of the convex side, the primary incision is carried through the cartilage and the membrane elevated from the concave side in the usual manner. A Bosworth saw is now inserted under the ridge or deflection inside of the membrane and the projecting portion is sawed off in the normal plane of the septum. The principal difficulty in this method also is at the base of the spur. The saw must project beyond it and must be patiently worked until the segment shows by its mobility that it has been completely severed. It is now attached to the mucous membrane only at the apex of the spur. The segment is now seized with the forceps and with a little manipulation slips out if its membranous sheath entire, the slight attachment at the apex of the spur offering practically no resistance. The surfaces are now approximated by means of strips of spunk and in two days in favorable cases the nose is to all appearances well, except of course at the point of incision. The septum is in place in the middle line; there is no inflammation, no hemorrhage and little inconvenience except from the discomfort of the packing.

The separation of the membrane from the cartilage and bone above and below the ridge and on the opposite side is somewhat tedious, but it is worth while and appreciated when the whole deformity slips out from between, intact and unbroken.

Frequently we find after sawing through the deformity that the bone is still attached at the extreme rear end. Since reading Dr. Irving Townsend's article in which he removes the whole spur with the chisel, I have used the latter quite successfully in these cases to complete the separation at the rear end. The chisel is inserted in the saw cut and readily finds the incomplete section of bone. The anterior border of the segment to be removed is naturally determined by the primary incision through the cartilage. In some cases the bony prominence will have been sawed through while the saw is still on the concave side of the cartilaginous portion. When this is the case the saw can be withdrawn, the Ballenger swivel knife engaged at the top of the cartilaginous incision and pushed back to meet the saw cut in the bone. I prefer to do these operations with the patient conscious and sitting, and have had no difficulty with nervous patients. I find that

$\frac{1}{4}$ grain of morphin by mouth before beginning has a most salutary effect and robs the work of all its terrors to the patient.

THE TREATMENT OF ATROPHIC RHINITIS BY PARAFFIN INJECTIONS.*

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ATROPHIC rhinitis is a condition with which all physicians are familiar. It is also one of the most trying that comes to the hands of the specialist. Up to the present time, palliation has been the sum of our achievement in the line of treatment.

The condition is characterized by a wasting away of the soft tissues of the nose. The mucous glands participate in this atrophic process and their secretion is changed from a watery to a thick, viscid consistency. This forms a tenacious coating over the turbinates which gives off what little moisture it contains to the passing air-current and forms dry crusts and clinkers. The odor of the breath is characteristic and extremely offensive, amounting to a stench.

The nostril is transformed into a cavernous charnel house. It is necessary for the patient to wash out the crusts daily with large irrigations of water, thus supplying in a flood the element which in health the normal mucous glands furnish constantly as required for moistening the inspired air.

The atrophic process once begun, the very conditions created favor its rapid development. Briefly, these are: 1st: Enlargement of the cavity; 2nd: More air to be moistened; 3rd: Perverted thickened secretion containing diminished supply of water. It is easy to see what an important role is played by the first of these factors—increased size of the cavity. By admitting larger and larger quantities of air it quickly becomes a determining one in the progress and development of the disease. This we see demonstrated in cases occurring in conjunction with deflected septa. The nostril, which is narrowed by the convexity of the deflected septum, is frequently free from the manifestaions of the disease, while the other or concave side, which is proportionately dilated, is profoundly affected. It was the

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THE TREATMENT OF ATROPHIC RHINITIS.

observation of this phenomenon which suggested to my mind the idea of artificially narrowing the lumen of the nostril by means of sub-mucous injections of paraffin.

It seemed to me possible to rebuild to a certain extent the inner structures of the nose and thus reduce the size of the cavity to something approaching the normal. For about three years I had been doing this, limiting my efforts until recently to the inferior turbinates, and the results while not wonderful were decidedly encouraging. I may say that they were gratifying in proportion to the successful accomplishment of the injections. It is characteristic of the disease that the mucous membrane is thin and closely adherent to the turbinates. The inferior turb itself is a rough, thin bone, which made it a matter of considerable difficulty to insert the needle of the syringe and still more difficult to prevent its pricking through and returning to the nostril at a point deeper in. When this occurred with discouraging frequency the paraffin was of course forced through the posterior opening, and would appear in the nostril. This was generally the first intimation that a puncture had been made, and rendered futile any further efforts at that time. By repeated efforts, however, an appreciable amount of the wax was forced beneath the membrane. As a result, it was noticed that an improvement followed which was frequently out of proportion to the success of the artificial rebuilding. It appeared that the paraffin caused a mild reaction and stimulated the blood-supply, setting up a slight hypertrophic tendency which tended to counteract the atrophic process. This theory was strengthened by the fact that there were outcroppings of granulation-tissue at the points of puncture. On the whole, however, the results of the treatment as above described, while encouraging, were not brilliant.

In the operation for submucous resection of the nasal septum it is necessary to separate the mucous membrane from the septal cartilage and bone throughout its whole extent. Since the results of the injections as above described were meager and inadequate so far as rebuilding was concerned, it was decided to supplement them by separating the mucous membrane from the septum and filling the pocket thus produced with paraffin sufficiently to narrow the lumen of the nostril to approximately normal width.

The case in which this was done was that of a young lady who was in other respects decidedly attractive. (It sometimes seems as

if attractive young women were elected to become the victims of this wretched disease.) The case was a typical one for the operation. The septum was deflected to the right and the condition of the membranes in that side was apparently normal. The left nostril presented all the disgusting features of a well advanced atrophic rhinitis. The characteristic odor was especially offensive, even after removal of the crusts. Injections had been made into the membrane of the inferior turbinate and that body quite successfully built up, but there still remained a large cavity owing to the deflected septum. A vertical incision through the membrane one-half an inch long was made at the anterior part of the septum, as if for a submucous resection. With a Freer elevator the membrane was then separated from the cartilage and bone. Into this pocket paraffin was injected until the bulging membrane had narrowed the cavity to approximately normal width down to the level of the lower border of the shrunken inferior turb. No packing was used and the incision healed by first intention.

The result was prompt and gratifying. The crust formation was diminished 50 per cent. and the odor equally reduced. Moreover, the crusts in addition to being much smaller were more moist, showing that the factor of dessication had been measurably reduced.

An observation was made with reference to the remaining crust-formation which encouraged to further work along this line. Whereas the incrustation had previously been distributed throughout the nostril, it was now limited to the space between the floor and the lower border of the shrunken turbinate. Since the septal bulge extended downward to about the same level, (having been left adherent to the maxillary ridge) there was still a space along the floor of about one-half an inch in diameter. It was determined to reduce this space by further injection. Since it was impossible to lower the turbinate, and seemed inadvisable to further loosen the attachment of the septal mucous membrane, nothing was left but to raise the floor. A cross-incision was therefore made at the edge of the mucous membrane down to the bone. The dull Freer elevator was then forced under the membrane hugging the bone, and the same was elevated from the base of the septal ridge to the border of the turb. With a Mueller paraffin syringe and a large canula this space was then filled until the floor was nearly on a level with the turb.

THE TREATMENT OF ATROPHIC RHINITIS.

This step was followed by considerable reaction. The face was swollen upon that side, and there was some pain for about forty-eight hours. These symptoms, however, promptly subsided with no further unpleasant after effects. The irrigations were continued for a couple of weeks, but the patient reported no crusts and was directed to stop all treatment in order to test the result. At the end of another two weeks she reported still no crusts and, most gratifying to state, the peculiar fetid, sickening odor had disappeared. To all appearances the case is radically cured, and I believe it to be the first case on record where this claim is justified.

The results of the pocket operation were so superior to the interstitial injections that it was applied to the inferior turb in two cases still under treatment. An incision was made anterior to and just above the attachment of the turb. The membrane was then elevated on that level well back to the rear. The elevator was then worked downward carefully toward the lower border of the turb. The inferior turbinate has a fore and aft curve, which makes it generally impossible to see the elevator under the membrane after it passes the middle point. There is therefore great danger of breaking through unless extreme care is taken. No sharp instrument must be used. Even the Freer dull elevator is too thin, although I have succeeded with it up to the present time. Even with a posterior puncture the pocket can be filled to a fair degree by partially withdrawing the canula and making the injections near the front. The pressure of the wax at the rear is thus diminished and the wound in the membrane is not forced open.

Assuming that the one case upon which this procedure has been carried out is cured, and that the same method can be applied to others, the question presents itself, Will the cure be permanent? Will there still be after-effects, and if so what?

With regard to the permanence I do not see how it can well be otherwise. The paraffin cannot undergo atrophy and the mucous membrane seems to accept its new matrix without the slightest protest.

It is possible that the presence of a foreign substance may cause a proliferation of normal submucous tissue which in addition to the paraffin may occlude the passage. In that case it ought to be a simple matter to press out through an incision sufficient of the paraffin to restore the caliber; and if this process is continued until all of the

paraffin has been pressed out we should have a radical cure indeed, with a restoration of the normal tissues.

But this is speculative. It is sufficient for the present that a cure seems to have been discovered for one of the most trying and previously intractable diseases which afflict humanity.

The value of the pupils in diagnosis has been greatly overestimated, says Richard C. Cabot. There are, in fact, comparatively few conditions in which they yield us important diagnostic evidence, for although they are very often abnormal the abnormalities are seldom characteristic of any single pathologic condition.—*Med. Rev. of Rev.*

The cocobacillus fetidus ozenae, Perez, as isolated by Hofer has answered all the bacteriological requirements necessary to establish its identity as the etiological factor in ozena.—Horn, *J. A. M. A.*, in *Med. Rev. of Rev.*

Fasten the ends of your bandages with library paste from a collapsible tube, instead of pins or adhesive plaster.—Buck, *Med. World*, in *Med. Rev. of Rev.*

FIBROADENOMA. REPORT OF A CASE.

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Kansas City, Mo.

FIBROADENOMA of the nose is rather rare* and may spring from the septum, turbinated bodies, or the floor.† In describing these neoplasms the authors take them up separately, fibroma being a dense fibrous growth, smooth and pinkish in color. It may be either sessile or pedunculated. Adenoma looks more like a polypus and bleeds very easily from the touch of the probe. It springs either from the region of the ethmoids or the septum. Osteoma is even more rare in occurrence than either the fibroma or adenoma and may spring from any of the accessory sinuses or the inferior turbinate.‡



I wish to report the following case in which all three of these structures are found in abundance.

On Jan. 4, 1915, H. S. W., a farmer, 5 ft. 10 in. in height, weighing 220 lbs., consulted me complaining of difficulty in breathing for the last four or five years. The last few months he had been unable to lie down on account of the smothering sensation. Anterior rhinoscopy

*Phillips.

†Ballenger, Phillips, Coakley.

‡Ballenger, Otto, Stein.

showed both sides of the nose completely filled with what appeared at first glance to be polypi. After an attempt at reduction with 4 per cent. cocaine the nasal cavities were still completely filled with this



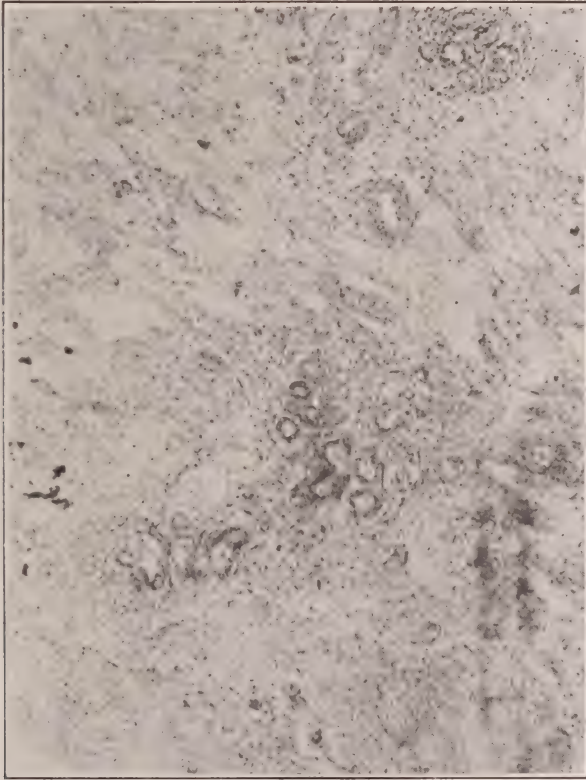
SECTION OF MUCOUS POLYP OF THE NOSE.

Toward the surface the tissue is glandular with the interaceneous tissue being largely composed of lymphoid tissue. Deeper than this, the tissue for the most part is composed of dense fibrous tissue. In parts this has become myxomatous. To the right is a mass of bone; this bony tissue was found extensively throughout the tumor, and in the old posterior part of the tumor this bony tissue predominated.

mass, which was immovable. A small malleable probe could be passed well back between the mass and the septum on both sides and between the mass and the inferior turbinate on the left side, but on the right

FIBROIDENOMA. REPORT OF A CASE.

side I found what I thought was an attachment to the posterior one-third of the inferior turbinate. The arch of the hard palate was very high; soft palate pushed forward. Upon digital examination of the post-nasal space a large bony-hard, immovable mass, completely filling the space was found. After thorough cocainization of the right side



SECTION OF MUCOUS POLYP OF THE NOSE.

INTERIOR OF THE TUMOR.

In this section the tissue is mostly myxomatous; in parts the tissue is composed of fibrous tissue, a few gland acini and numerous blood vessels with well defined walls.

the adhesion between the mass and the inferior turbinate was severed with a Struycken punch, and with strong forceps an attempt made to pull it forward without the slightest movement being accomplished.

I then, without removing the forceps, made pressure backwards, and to my surprise the mass dropped into his mouth. It was a half circular mass, round at one end and cleft at the other (where it had been astride the septum), smooth, and pinkish in color, two and one half in. long, one and one-fourth in. wide, depth of the cleft one and one-half in.



SECTION OF MUCOUS POLYP OF THE NOSE.

INTERIOR OF POSTERIOR PART OF TUMOR.

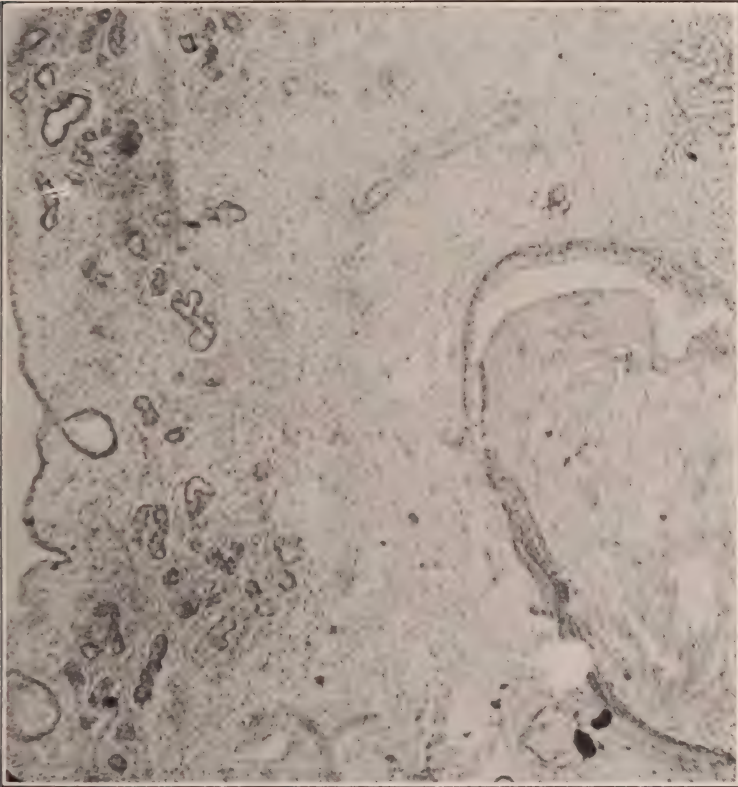
In this section the tissue is composed of dense fibrous tissue; few gland spaces and large areas of dense bone.

I now examined the left side of the nose and found it perfectly free and open. The photographs of this specimen and sections, with the pathologist's report, are self-explanatory.

FIBROIDENOMA. REPORT OF A CASE.

PATHOLOGICAL REPORT.

Dec. 16, 1915. *Microscopical Examination:* The section showed that the tumor is composed of adenomatous tissue embedded in dense fibrous tissue. In parts this fibrous tissue has become myxomatous, and in parts also calcification has taken place, and in several places there is definite new bone formation. The gland tissue of which this



SECTION OF MUCOUS POLYP OF THE NOSE.

Section from the anterior end of the tissue showing the surface composed largely of gland tissue, the deeper structures being more fibrous and myxoedematous. In the lower part of the section is a large cyst, many of which were found in the deeper parts of the tumor.

tumor is largely made up is very similar to normal gland tissue of the nose. The acini are regular, same size and show no evidence of malignancy.

Diagnosis: Fibroadenoma.

SUBMUCOUS RESECTION OF THE NASAL SEPTUM WITH REPORT OF CASES.*

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THE nasal septum has been the cause of much discussion, especially during the past ten years. So much has been written about its formation, its various defects and the remedies for the correction of these defects, it would seem that the subject is well nigh exhausted. However, under certain conditions it plays such an important part in the causation of many nasal diseases as well as affections of other structures more or less intimately connected with the nose, that I venture to bring the subject before you again, even at the risk of repeating some things that may have been brought to your attention before. If I succeed in making you realize more fully the importance of this structure, both in its normal and abnormal state, my efforts may not be in vain.

It is a fact that in the examination of noses we are surprised to find such a small per cent. of normal septa. This is true especially in the Anglo-Saxon race, the proportion being given by various investigators at about twenty-five per cent. In the negro race we find few deviated septa. One reason given for the small number of deviations in the last mentioned race is that the development of the brain in the child is not so rapid as in the Anglo-Saxon, and hence the base of the skull does not cause downward pressure upon the septum in its early stages of formation. In all very young children we find the septum to be normal unless there is some congenital deformation or trauma; consequently, we must infer that whatever produces a deviation from the normal must take place in the early years of the child's life. Traumatism of course may be a factor at any age.

In looking up the etiology of septal deviations we are almost amused to find how many different theories are advanced. I quote from Ballenger, "Diseases of the Nose, Throat and Ear," Fourth Edi-

*Presented at the Annual Meeting of the O., O. and L. Society, Chicago, June, 1915.

tion: "Morgagni thought they were due to excessive development of the vomer; the vomer crowding upward against the descending perpendicular plate of the ethmoid caused septal deflection to one side in order to allow of continued development. Jarvis believes the chief cause to be heredity. Trendelenburg and Freeman think the chief cause is in the persistent high arch of the hard palate. The vomer and perpendicular plate of the ethmoid are thereby crowded and deflected in order to find room for further development. Schaus and Welker say the cause is in the faulty development of the facial bones, including the bones of the nose. Bosworth argues traumatism is the chief cause of deflection. Talbot carries still farther the theory of Schaus and Welker, and says that malformations of the septum are due to neuroses or stigmata of degeneracy which result in irregular development of the facial bones. He believes that pigeon-breast, adenoids and deformed nasal septa are due to the same neurotic influences which arrest development in some parts while in others there is an increase of development."

From these various theories it is evident that some one is wrong. It is quite possible, however, that each may be partially right, and yet from the many probable causes advanced we fail to arrive at any definite conclusion. We may accept in part the various explanations, yet those of us who happen to have deviated septa may object to Talbot's "Stigmata of degeneracy" theory. Ballenger suggests that Talbot's phraseology might be changed to say, that "deflections of the septum are due to an inco-ordination in the development of the bones of the face." This does not throw any more light on the subject but it may be less offensive.

The writer believes that at least one leading cause of septal deviations is adenoids. On account of this tissue in the naso-pharynx the child is compelled to breathe a greater part of the time through the mouth, thereby producing a high-arched palate which crowds upward the vomer and perpendicular plate of the ethmoid—which meet resistance from above and the result must be a deflection of the septum. The nostrils also become narrowed from non-use. It is claimed by some authors that 96 per cent. of septal deviations are accompanied by a high-arched palate. This high arch can nearly always be associated with adenoids in earlier life. Now the question comes—what causes adenoids? and here we are again confronted with numerous

theories none of which are satisfactory explanations. If we can accept Talbot's theory of neuroses, or "stigmata of degeneracy," we may have the real underlying cause. It would indeed be interesting to know positively the cause, for as advocates of preventive medicine, as we all must be, we would then be able to remedy this evil in its incipency, and thus relieve many future ills of humanity. There is no one condition in connection with our specialty which is the cause of more real damage than deviations of the nasal septum. On account of improper nasal breathing we may be confronted with an ethmoiditis due to a lack of proper nasal drainage of these important cells, which when they become diseased may, on account of their close proximity to the orbit, produce various diseases of the eyes; and by reason of their intimate connection with the frontal and sphenoidal sinuses, a violent inflammation and possible suppuration may take place there. These conditions may call for serious surgical interference. Infection may even extend to the brain, producing abscess of the frontal lobe. The constant passage of infectious material, improperly draining by way of the naso-pharynx may, through the Eustachian tube, set up a suppurative otitis media, followed later by mastoiditis and involvement of the labyrinth, and perhaps a temporo-sphenoidal or cerebellar abscess. These conditions are all possible and are most serious, as you well know. On account of mouth-breathing the inspired air is not properly tempered, particles of dust are not arrested and we may have as a result laryngitis, bronchitis or lowered resistance of the lung-tissue. By pressure upon various nerves in the tissues of the nasal cavities or adjacent to them, due to septal deviation itself or to conditions produced thereby, we may have chronic headaches, deafness, tinnitus aurium, asthma, hay fever and other neurotic conditions.

You may say that I have overdrawn the picture of the diseases and symptoms which may be produced by deformities of the nasal septum. I do not mean to convey the idea that every case of septal deviation will produce all the conditions mentioned above, but I do wish to emphasize this fact: All the processes named have a beginning somewhere and at some time. A nose so obstructed as not to allow correct breathing is bound to be at least the means of lowering the resistance of the tissues and the structures which normally have the benefit of pure air. This lowered resistance makes them more susceptible to the many diseases to which this part of the anatomy is subject. If we

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would prevent disease we must remove the causes that lead to it. The very first lesson to be learned in the treatment of diseases is to remove the cause. This axiom must hold good in prevention as well as treatment. I do *not* believe that I have overdrawn the picture in relation to the many diseases which may have their beginning in the various forms of septal deviation. Anything which interferes with normal nasal breathing and drainage must eventually cause trouble, and deviation of the septum is a cause of abnormal breathing and improper drainage in such a large percentage of cases which have gone on until some one or more of the diseases already mentioned have developed, that it is worthy of our most serious consideration. Hypertrophied turbinated bodies are often a cause of blocking of the nasal chambers. Many cases of enlarged turbinated bodies are due to deviated septa, interfering with drainage and thus causing congestion and inflammation of these bodies and subsequent hypertrophy. No case of subacute or chronic deafness has been gone into carefully until the nose and naso-pharynx have been the subject of the most painstaking examination. It is almost useless to treat cases of deafness without first correcting septal deformities, if present, and otherwise providing normal air passages through the nasal chambers. You have thus in many cases removed one of the underlying causes—a cause which in most cases, however, should have been removed perhaps years before. In the light of modern nasal surgery the almost marvelous results obtained by the proper correction of septal deviations are very satisfactory. The submucous resection is a great advancement over the old-time method of sawing off “spurs” and “humps”—mucous membrane and all. By the submucous method the mucous membrane is saved and there is thus no loss of its normal secreting and protective function.

I do not believe there is any operation in nasal surgery which when properly indicated and well performed is so gratifying to both patient and surgeon. I believe in cases where there is both a deviated septum and hypertrophy of the turbinated bodies that the septum should have first attention, giving all the breathing-space possible by this procedure. In many cases the patient will be able to breathe well after the operation and often the hypertrophied turbinates will go down to a great extent, which may obviate the necessity of further operative procedures. In nasal surgery we should sacrifice as little mucous membrane as possible.

Preventive medicine is the great cry to-day. I believe many cases of septal deviation can be prevented by the early removal of adenoids. It is almost a crime the way thousands of children are neglected by allowing adenoid tissue to remain in the naso-pharynx, obstructing the breathing, laying the foundation for future ills, and reducing the efficiency of the child fully 50 per cent. in many cases. The harm done by neglect is often beyond repair and not only interferes with normal nasal function but also with mental activity. So if we do not know yet how to prevent adenoids, let us at least prevent septal deformities in many cases by the early removal of the hypertrophied pharyngeal growths. In one hundred years from now septal deviations except from traumatism may be a rarity. In the meantime, let us not forget those cases which we meet in our daily practice, and will meet for a few years at least. Let us also try to prevent the various sinus diseases, ear complications, reflex disturbances, etc., by removing at least one of the most prolific causes of these conditions—namely by the correction of deviated nasal septa.

Out of a series of over one hundred cases of septal correction I will briefly report a few taken at random. Of these one hundred or more cases a very large percentage have expressed their gratitude to me for the benefit received. It was not possible to follow up all the cases, but the greater number have reported favorably and the after-examination has borne out their statements, so that I feel justified in saying that the cases here reported represent the general consensus of opinion of the series. These cases are from the service of Dr. Dean W. Myers' Clinic, Univ. of Mich., during my assistantship there.

Oct. 14, 1914. Miss B. S., æt. 21. Has had a cough since a child. Had a fall when four years old striking nose. Nose bled much. No doctor called. The mother thinks cough dated from time of the fall. Cough has been accompanied by thin yellowish expectoration. Usually worse after dinner. Does not bother at night. Aggravated by running, or laughing and in winter season. Has had a nasal discharge of mucopurulent character as long as she can remember. Much "dropping" in throat. Feels tired in the morning on arising. Breathes through the nose with difficulty.

Examination of the Nose. Septum badly deviated to left. Large spur on left side of vomer. Right middle turbinate much enlarged. Much mucopurulent discharge from nose. High arched palate.

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OPERATION.—Submucous resection of the septum and removal of spur. It was deemed advisable in this case to perform also a right middle turbinectomy, which was done. Recovery from the operation uneventful. Six weeks after the operation patient reports nasal discharge nearly gone and character of discharge changed from mucopurulent to whitish. Now feels rested and refreshed in the morning on arising. Cough much better. Expectorates less. Laughing or running does not cause coughing spell as formerly. Breathes through the nose without difficulty. "Feels like a new person." Later reports verified all the above, with patient still improving.

Oct. 31, 1914. M. C. D., æt. 22. Clerk. Has had cough for four years. Worse in winter and spring. Evidently tubercular. Has lost ten pounds in the last few months. Has been "tired" for a year. Difficult nasal breathing and much catarrhal discharge from nose. Examination reveals very large spur on left side of septum. Removed by sub-mucous method. Wound healed nicely in two weeks and patient says he breathes much better than before. Cough still continues (did not hope to relieve the cough by operation except in a general way by helping him to breathe properly). Patient expects to go to California for the winter.

Nov. 10, 1914. Mr. E. O. M., æt. 23. Traveling salesman. When sixteen years old voice began to "change." Has never completed the "change." During past year has been getting worse. Has to "clear throat" very much. Much pharyngeal and post-nasal catarrh; laryngitis. Otherwise seems in good health.

Examination of Nose. Very badly deflected septum, left side. Interferes greatly with his breathing. Takes cold very easily. Submucous resection of septum, nose healed nicely in ten days. Three months later reports voice considerably improved. Breathes freely through nose. Catarrh better. Feels better in general.

Nov. 12, 1914. W. M. E., æt. 25. Student. Has had nasal catarrh seven years. Whitish and yellow discharge. Much "dropping" in throat. Mouth breather. Very narrow nostrils. Very thick septum. High arched palate. Sub-mucous resection. Healed without difficulty. Three months later reports breathing very much improved. Nasal discharge less. Now mucous in character. Feels much better in general on account of improvement in breathing.

Oct. 15, 1914. Miss G. S., æt. 22. Student. Has had difficult

nasal breathing since eight years old. Some improvement in breathing after fifteen years old, evidently due to atrophy of adenoid tissue. Has had headaches for past five years, also dizziness for past two years. Glasses do not relieve headache. Eyes refracted one month ago. Headaches and dizziness seem to have no special connection with menstrual function. Considerable nasal discharge. Patient quite nervous.

Examination of Nose. Very large spur on left side of septum. Interferes with breathing and nasal drainage. Sub-mucous resection. Spur removed. Recovery uneventful.

Dec. 1, 1914. Patient much improved, breathes through the nose without difficulty. Feels more refreshed in mornings on arising than formerly. Dizziness much improved. Headaches and nervousness better.

March 4, 1915, dizziness entirely gone. Headaches seldom. Breathes fine through nose. General improvement very marked.

Oct. 20, 1914. Dr. J. D., æt. 26. For years has had "something" in throat. Made voice husky. Scarcely ever breathes through both nostrils at the same time. Aggravated in damp weather. Very subject to nasal colds. Hyperesthetic rhinitis. For past two or three months has had frequent frontal headaches with general feeling of ill-being and some nausea. Thought glasses were not right but changing them did not improve symptoms.

Examination of Nose. Badly deflected septum. Submucous resection; also removed anterior-inferior portion of left inferior turbinate by submucous method.

Nov. 19, 1914. Reports by letter: "Since operation have had no frontal headaches; after first night have breathed through both nostrils all the time even when I have a cold." Feels better in general. Throat symptoms not much better as yet. Have had no later report.

Nov. 10, 1914. Mr. M. F., æt. 22. Printer. For past five years could not breathe well through nose; breathes through each side alternately. Nasal catarrh. High-arched palate.

Examination of Nose. Deviated septum to right, large spur posteriorly. Left inferior turbinate enlarged. Submucous resection of septum and removal of spur. Recovery uneventful.

March 7, 1915. Examination. Plenty of air-space on right side.

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Left inferior turbinate not so large. Breathes much better through nose; feels more refreshed on arising. Catarrh all gone.

Nov. 28, 1914. Mr. R. D., æt. 22. Student. For past four or five years sneezed a great deal; some days nearly all the time. Especially irritated by dust. Nose stuffed up on both sides a great deal of the time. Breathes through each side alternately. Catarrh but not purulent. Has cold most of the time. Hypertrophic rhinitis.

Examination. Deviated septum and enlarged middle turbinate on both sides. Submucous resection of the septum.

March 14, 1915. Reports by mail: "Difficulty in breathing entirely relieved. Free from colds and feel fine in general."

Nov. 25, 1914. Mr. D. M. C., æt. 21. Student. About six years ago was kicked on the nose while playing basket-ball; since then has had trouble with colds; increasing in severity. Worse on right side of nose. No catarrhal discharge except when he has a cold. Has a chronic cough; evidently reflex.

Examination. Septum badly deflected to the right. Submucous resection of the septum. In twenty-four hours after operation this patient developed a temperature of 105° ; pulse 120; delirious. Gave aconite. Twelve hours later temperature 104° . Fearing infection gave echinacea tr.—thirty minims every two hours. In twenty-four hours temperature 101° . Continued echinacea every four hours. Temperature gradually came down to normal in four days and patient made an uneventful recovery.

March 30, 1915, reports by letter operation very satisfactory. Cough cured. No more trouble with catarrhal cold in head. Breathes fine. Very much pleased with the results of the operation.

December 15, 1914. Mr. L. L., æt. 27. Dairyman. Had nose broken sixteen years ago while skating. Has had much difficulty in breathing, especially the last five or six years. Has had a cough for several months. Expectoration a yellowish muco-purulent matter. Post-nasal catarrh.

Examination of Nose. Septum badly deflected to left. Submucous resection. Recovery uneventful.

March 4, 1915, patient reported in person. Breathing through nose O. K. Cough better. Has gained fifteen pounds in weight; catarrh much better; feels much better in general.

December 18, 1914. Mr. L. D., æt. 25. Complains of cracking

in ears for the past two years. Has had nasal catarrh for three years. Muco-purulent discharge. Complains of stuffy breathing especially when in warm room. Examination of nose revealed a deviated septum to left pressing against middle turbinate. Right middle turbinate much congested. Submucous resection.

On January 21, 1915, catarrh was much improved. Cracking in the ears some better. Breathing is much easier. Sleeps better and feels a general improvement of all symptoms.

Jan. 23, 1915. Mr. C. S., æt. 24. Student. For past one and one-half years has had a collection of mucus in throat which at times prevents him from speaking until he clears his throat. Breathes principally through left nostril. Small ulcer on the septum which bleeds much at times. Post-nasal catarrh. Examination of the nose shows septum deviated to the right. Submucous resection.

March 30, 1915. Mucous condition in the throat much improved. Now bothers him very little. Breathes well through both nostrils. Bleeding stopped. Very much pleased with results.

Jan. 27, 1915. Mr. P. G., æt. 23. Twenty years ago, fell and struck nose against door, resulting in a broken nose. Has much difficulty in breathing through the right side. On exertion "cannot get enough air;" has to breathe through mouth a great part of the time, especially if he exerts himself. Subject to frequent colds. Has post-nasal catarrh.

Examination of the Nose. Right nostril almost occluded. Septum badly deviated. Submucous resection.

March 3, 1915. Patient reports by letter,—“Breathing capacity fine. Can breathe perfectly through the nose on exercising. Especially noticeable in gymnasium work. Have had no cold since operation. Catarrh all gone. I am more than pleased with the results of the operation.”

March 16, 1915. Miss M. C., æt. 21. Has had much post-nasal catarrh; “dropping” in the throat for the past two years. Difficult to breathe through the nose. Breathes with mouth open while sleeping. Shortness of breath.

Examination of the Nose. Left deviation of septum. Submucous resection.

March 24, 1915, patient reports in person that she is very much

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improved. Breathes through the nose fine. Nasal discharge almost gone.

April 14, 1915. Mr. H. R., æt. 23. Student. Several years ago was hit on the nose with base ball. Since then can only breathe through right side of the nose. Shortness of breath upon exercising.

Examination of Nose. Left nostril almost occluded; cartilaginous portion of septum very thick. In this case I did only a submucous resection of cartilaginous portion of septum.

On May 20, 1915, patient reports that his breathing is good **through both nostrils**. Does not now complain of shortness of breath when exercising. Very grateful over result.

May 29, 1915, Miss I. P., æt. 26. Teacher. Has much difficulty in breathing through nose. Has been gradually getting worse for the past year. Some dropping of mucus in throat, especially in mornings on arising. For the past three years has had severe headaches every two or three weeks, sometimes more frequently. No worse at menstrual period. Glasses do not relieve headaches.

Examination of Nose. Septum deflected to right; both inferior turbinates hypertrophied; middle turbinates also somewhat enlarged. Submucous resection of septum. Also removed by submucous resection the anterior-inferior portion of both inferior turbinates.

On June 22, 1915, patient reports, "can just breathe fine; catarrhal discharge much less. Headaches very much improved; in fact, have had no headaches since second day after operation."

May 24, 1915. Miss D. B., æt. 16. Complains of deafness for the past six months. Breathes through mouth at night and part of the time during the day. Catarrhal discharge from nose. Has right deviation of septum. Did a submucous resection of the septum.

June 23, 1915. Breathes freely through both nostrils; catarrhal discharge much less; deafness improved. Says operation is very satisfactory.

May 6, 1915. Mr. E. P., æt. 31. Farmer. Has much trouble with catarrh and takes cold easily. Cannot breathe well through the nose, especially at night. Has been this way for several years.

Examination of Nose. Septum deviated to right. Impacted right middle turbinate. Enlarged left middle turbinate. Did submucous resection of septum. After removal of deviated part of septum there was

breathing space between septum and right middle turbinate. Recovery from operation in one week.

June 1, 1915. Breathes nicely through nose at night. Catarrhal discharge less. Examination reveals good breathing space in both nostrils. Left middle turbinate reduced in size.

May 8, 1915. Mr. A. L., æt. 20. Student. Cannot breathe through the right nostril except occasionally. Catarrhal rhinitis. Mouth and throat dry, especially in the mornings, from breathing through the mouth. Slight deafness.

Examination of Nose. Right nostril almost occluded. Can only pass probe between septum and turbinate on right side. Tissues shrink very little under adrenalin. Did a submucous resection of septum; going well back. Recovery O. K.

June 15. Patient can breathe through the nose without difficulty. Nose healed nicely and plenty of space. Feels very much relieved of catarrhal discharge. More refreshed in mornings on arising. Deafness better. Well satisfied with results.

May 15, 1915. H. F., æt. 34. For years has had difficulty in breathing well through the nose. On exertion "puffs and blows." Cannot stand hot towel over the face after shaving. "Suffocates."

Examination of the Nose. Septum deflected to left, two large projecting spurs. Septum looks "crumpled." Full of sharp angles and deflections. Much catarrhal discharge. Did submucous resection. Very difficult to dissect membranes on account of many sharp angles. Membrane very thin. Perforated membrane on opposite side from incision, but not directly opposite incision. Left piece of cartilage under perforation. Bleeding was unusually free in this case. After removal of "humps," spur and deflections, there was good space for breathing.

June 26, 1915. Breathes fine through the nose. That suffocative feeling gone. Does not "puff or blow" as he formerly did upon exercising. Wound healed nicely. All nasal symptoms improved.

March 18, 1915. Miss B. P., æt. 28. Has "cold" most of the time. Soreness over eyes, especially on nasal side. Very sensitive to touch. Rim of orbit and nasal bone sore. For some time has had difficult breathing and asthmatic attacks. Has to go to the window at night for air.

Examination of Nose. Very large middle turbinate on right side, filling upper air passage in nose. Thick yellow muco-purulent dis-

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charge flowing down between middle turbinate and outer wall from infundibular region. Transillumination shows both maxillary sinuses clear. Septum on left side deviated and pushed over against ethmoid and middle turbinate. Difficult to get probe between without shrinking tissues. Did a submucous resection of septum. Case bled profusely during the operation. Patient very nervous but withstood operation well. Operation was not painful but patient evidently drew on her imagination. Was "afraid it would hurt."

June 26, 1915. Patient reports, "I can now breathe through the nose. Have had no attack of asthma since operation. Catarrhal discharge is very much better. Feel so much better in general. I am more than pleased."

April 3, 1915. Mr. J. W. R., æt. 22. Student. Nose injured playing foot-ball several years ago. Has difficulty in breathing, especially when exercising and when sleeping. Catarrhal rhinitis.

Examination of the Nose. Deflected septum in "all" directions; numerous spurs and humps on both sides. Has the appearance of having been crumpled. Submucous resection of septum. Spurs and humps removed under mucous membrane.

April 25, 1915. Breathing through the nose without difficulty. Rhinitis much improved. Can get plenty of air through nose when exercising.

April 11, 1915. Mr. R. A. W., æt. 43. Railroad man. Chronic rhinitis, pharyngitis and bronchitis. Has also been hard of hearing. "Clicking" in ears. Rhinitis.

Examination of Nose. Septum deviated to the right. Hypertrophied middle turbinate. Submucous resection of the septum.

May 10, 1915. All conditions of the nose and throat much better. Improvement in hearing. Clicking sounds in ears gone. Breathes freely through nose.

April 2, 1915. Mr. C. B. R., æt. 22. Machinist. Complains of much soreness in region of frontal sinuses. Post-nasal "dropping;" scabs in the nose. Breathing difficult.

Examination of Nose. High posterior deviation of septum to left. Left middle turbinate impacted. Right middle turbinate much enlarged. Did submucous resection of septum and middle turbinectomy. Curettage of ethmoid cells.

May 25, 1915. Reports soreness in frontal region has disappeared.

Catarrhal discharge very much lessened. "Dropping" in throat almost gone. Breathes freely through the nose.

April 3, 1915. Mr. R. H. W., æt. 22. Student. Nose injured several years ago. Can scarcely breathe through the nose. Especially noticeable on violent exercising and at night.

Examination of Nose. Septum seems deviated in all directions. Puckered appearance. Many sharp angles and projections into nares on both sides.

Did submucous resection of septum.

June 10, 1915. Patient says: "Now I can breathe freely through the nose; sleep refreshing and feel much better in general. I am very much pleased with the result of the operation."

The reports of the above cases are a very fair indication of the series of over one hundred operations for submucous resection of the nasal septum. In many cases of the series the results were even more marked than some of the most favorable cases here reported. In several cases the results cannot be foretold for several months. These are cases in which there was enlargement of the turbinated bodies and which were not removed. In the majority of cases the turgescence, or hypertrophy, will be much reduced after a few months, when the drainage which has been blocked by septal malformation has been established. In some cases it is necessary to do a partial or complete turbinectomy before the more serious conditions, such as ethmoiditis, frontal sinusitis, etc., are relieved.

I imagine I hear someone saying, "I wonder if in this series of one hundred or more cases there were no permanent perforations of the septum?" I will answer you by saying, Yes. I particularly recall one case—not reported above. This was the case of a young man from Northern Michigan. He had an extremely "thin" nose. The nostrils were almost like slits. Very little room to work. He had a chronic mucopurulent catarrh; deviated septum to right side. I operated the case under considerable difficulty on account of the very limited space in which to work, due to the narrow nostrils. The membrane was very thin and was perforated, and remained so. Two weeks later a friend of his came to the hospital to have his nose operated. The above-mentioned patient told his friend to be sure to have me operate on his nose for I had given him such wonderful relief. When the friend told me this I was much amused inwardly, for I thought

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this was about the poorest piece of work I had ever done. But I operated on his friend's nose and am pleased to say had a fine result and no perforation,—and a very grateful patient. But after all a perforation is no serious matter. The improved breathing space, due to removal of the obstruction, and the consequent comfort to the patient overcomes any slight annoyance from a perforation. I desire to state, however, that only in a very small percentage of the cases did we have a permanent perforation.

PERFORATIONS OF SHRAPNELL'S MEMBRANE.

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PERFORATIONS of Shrapnell's membrane were first described by Moos in 1864, and later exhaustive studies of this subject were made by Green, Blake, Buck, Burnett, Politzer, Morpugo and Hessler. Randall, in 1890, presented a most interesting summary of the subject.

To appreciate the contentions concerning perforations in Shrapnell's membrane, one must have a proper conception of the anatomy of this interesting portion of the drum-membrane and its relation to the attic, or epitympanic space. Shrapnell's membrane is composed of two layers of tissue,—one facing the external auditory canal consisting of epidermis, and a second layer directed toward the tympanic space, consisting of mucous membrane. It completes the ring of the annulus tympanicus, by bridging over the Rivinian notch. Behind Shrapnell's membrane we find the neck of the malleus, and between the membrane and the neck a pouch known as the inferior external pouch, or the space of Prussak, limited above by the external ligament, below by the processus brevis and externally by the membrane of Shrapnell. This pouch has a blind extremity anteriorly while posteriorly it communicates with the general tympanic cavity. Helmholtz describes a series of pouch-like cavities or compartments in the epitympanic space formed by the reduplications of the mucous membrane lining the part. This mucous membrane is also the periosteum covering the walls of the tympanic cavity and the ossicles. Under normal conditions these pouches enjoy adequate drainage, but in the presence of inflammatory changes there is swelling of the mucosa and the communication between the pouches and the general tympanic cavity is cut off. This explains the circumscribed bulging seen in this region during subacute and acute otitis media. It is fair to assume also that in acute otitis media this area of the tympanic cavity takes part in the process, and even after resolution occurs there is left behind changes in the mucosa which interfere with adequate drainage, and which may result in a

chronic secretory condition with the occurrence of a perforation; or adhesions may form with their retracting influence and the production of a perforation, as in tubo-tympanic obstruction. If the condition results in a destructive process the nutrition of the ossicles and surrounding bone of the epitympanic space is interfered with and necrosis results.

Perforations of Shrapnell's membrane are considered by some otologists as invariably indicating necrosis, while others believe it is possible to have a perforation in this portion of the membrane as a result of atrophy. Dench claims that perforations above the short process always indicate intra-tympanic necrosis and also involvement of the malleus. Kerrison does not agree with this, as perforations of Shrapnell's membrane very rarely occur during acute middle ear suppuration. He further states that he has found these perforations in ears where there was no evidence of tympanic suppuration, either present or past. In support of this, Bezold associates the occurrence of these perforations with chronic obstructive lesions and attributes the perforation to an atrophy, the result of continued retraction. Politzer, quoting Hartman, states that he frequently encountered perforations of Shrapnell's membrane where the *membrana tensa* was intact but retracted. Politzer has observed the development of a perforation in Shrapnell's membrane during chronic middle ear catarrh. We have made this same observation. In one case, a female patient who had been under our observation for three years developed gradually, with absolute absence of inflammatory symptoms, a perforation above the short process. A like condition was observed in another female patient whom we observed for two years. A third case was seen in a young male subject who was suffering from leukemia. This patient presented waxy-white drums, with smooth clean edge perforation immediately above the short process in the right ear. The patient had had dull hearing for several months. There had never been any symptoms of inflammatory involvement.

In this class of cases Politzer says, "The *membrana flaccida* is drawn into the depression above the *processus brevis*, when it subsequently breaks down under the influence of compression of epithelial masses there accumulating from the skin of the external auditory canal."

Phillips associates perforations of the *membrana flaccida* with

necrosis of the ossicles and disease of the attic, aditus and mastoid. He further contends that they permit the ingrowth of epithelium from the external auditory canal, thus favoring the development of cholesteatomata. He considers this a very dangerous type of perforation, usually requiring a radical mastoid operation. Ballenger believes that perforations of Shrapnell's membrane signify necrosis of the head of the malleus. Barnhill and Whales contend that these perforations are exceedingly important, and distinctly indicative of attic and mastoid involvement requiring surgical intervention. Bishop is also of the opinion that perforations in this region are to be associated with necrosis in the attic.

From clinical observations we would conclude that perforations in Shrapnell's membrane may be classified as those associated with chronic tubo-tympanic obstructive lesions and those belonging to the chronic suppurative class. The perforations due to obstructive tubo-tympanic disease may become suppurative through subsequent infection. It is interesting to note in many cases where suppurative lesions are found that there is an absence of a history of acute aural suppuration; in fact, many of these cases are serenely ignorant of a discharging ear. They usually come to us for dull hearing or because of pain. The local condition in this class of cases is often misinterpreted by those who are not expert or thorough in their examination. The membrana tensa may be intact and exhibit a fair appearance, and the defect in the membrana flaccida may be bridged over by epithelial debris. In other cases there is a more profuse discharge, which accumulates over the superior and posterior wall and piles up in dark masses intimately adherent to the walls of the canal. It is necessary in making an examination to carefully remove this debris before we can determine the condition. These dried crusts of secretion are not infrequently mistaken for cerumen, and it is only after frequent unsuccessful attempts to remove it by irrigation that its true nature is discovered. The most satisfactory way to remove these crusts is to have the patient assume the recumbent position on the side, the affected ear up, then flood the external auditory canal with peroxide of hydrogen. This will undermine the crusts so that they may be removed by irrigation or with the aural curette or forceps. The picture presented after the removal of this dried secretion often comes as a surprise to the examiner, for various grades of destruction are found, from small

perforations about the neck of the malleus to complete absence of the outer wall of the attic.

In cases where perforation occurs as a result of the pressure-atrophy, we believe in the policy of non-interference. The handling of cases where there is active secretion presents an entirely different proposition. We do not believe that all cases of perforation of Shrapnell spell necrosis; this is a matter to be proven by deeper investigation. We have seen cases of this kind cover over with epithelium by simple cleanliness. This is best accomplished by careful removal of the crusts and absolute dryness of the canal. The operation of ossiculectomy has been practiced in this form of middle ear suppuration but is not indicated unless it can be proven that the necrosis is confined to the ossicles. Where there is positive evidence of necrosis of the attic walls the radical mastoid operation should be considered. These cases go along quietly for years, in some instances giving little or no trouble; others get along for a time then develop symptoms of focal infection and local irritative symptoms,—as headache, hemi-crania, dizzy attacks, heaviness of the head. At such time it is obvious that nothing short of radical surgical measures can be expected to relieve the condition.

2102 Chestnut Street.

Smoker's commisural patches—whitish lines or a triangular patch on the mucosa extending back from the juncture of the lip toward the first molar—Landouzy has found exclusively in syphilitics and considers them pathognomonic; the tobacco being merely the local irritating, exciting cause.—*Universal Med. Rec. in Med. Rev. of Rev.*

Bednar's aphtha, two symmetrical oblong erosions on the hard palate or gums in young infants, are caused by washing the mouth too vigorously.—Zahorsky, *Med. Rev. of Rev.*

HEAD HEMORRHAGE.*

FRED. C. SAGE, M. D.,

Waterloo, Ia.

IN the realm of work of the eye, ear, nose and throat surgeon hemorrhage is probably of less relative importance than in general surgery. Nevertheless, since alarming cases may become one's experience at any time, both in surgical work and in cases of a spontaneous nature, a state of preparedness becomes both expedient and necessary. Owing to the unusual difficulties in controlling hemorrhage in rather inaccessible cavities and the occasional bleeder or hemophilic encountered, the surgeon may suddenly find it necessary to mobilize all his forces. His general knowledge and surgical skill in arresting hemorrhage may then need supplementing by special skill, initiative and technique.

Hemorrhage in throat operations will be considered first, and would seem to be first in frequency and importance.

ADENOIDS. Many looking upon adenoid operations have remarked upon the sanguinary character of the operation, and compared with an appendectomy it is so. Yet the experienced throat surgeon expects only this first gush of blood. He may apply diluted dioxygen with some pressure on cotton tampons several times, but usually little else is required. Only in cases of partial or incomplete removal of adenoids has the author observed any continuous troublesome hemorrhage, and in several such cases that had been operated by the family physician the bleeding at once stopped after a more thorough removal. The trained throat surgeon would hardly be expected to leave any adenoid tissue after operating, but a routine finger-examination should always dispel any doubt and make certain that the work has been thoroughly done.

TONSILS. Barnes, of Harvard, in his new book on the tonsils says: "In removal of the tonsils the amount of hemorrhage depends very largely on the skill used by the operator." If performed im-

*Presented at the Annual Meeting of the O., O. and L. Society, June, 1915.

HEAD HEMORRHAGE.

properly with laceration of the tonsillar pillars and removal of any considerable portions of them *with the tonsil*, or with an incomplete enucleation of the tonsil, the hemorrhage in an otherwise simple case may become very troublesome and even dangerous. I am convinced that much more depends on these two points, careful enucleation or separation of the pillars, and thorough removal—by preference in the capsule of course—than on whether we use snare, tonsillotome, guillotine or what not to finish our operation. As difficult diseases, such as catarrh and consumption, have many sure cures advertised, so there is a veritable multitude of tonsil separators. The first instrument catalogue I picked up had listed 67 tonsil knives or separators—ten more than the famous 57 varieties of Heinz's little pickles—besides 16 pairs of scissors, making 83 in all in this one catalogue. This would indicate that some certain difficulties had occurred to various operators in separating the tonsils from the pillars; else why invent another instrument for the purpose? I want to claim originality by not recommending my own tonsil knife. In separating the tonsil pillars I use my friend Dr. Hazeltine's sharp sickle-shaped knives by preference when operating under local anesthesia, and Dr. Foster's finger-enucleation method when the patient is under a general anesthetic, though sometimes using other knives or scissors; for the final enucleation using either snare or tonsillotome.

The Sluder method never appealed to me because of its greater danger of inclusion of the tonsil pillars and of hemorrhage, and observation seems to justify this conclusion. But any method may be good if a proper technique is carried out, such as careful and complete separation of any adhesions, correct application of the tonsil forceps and snare, and just the right amount of traction before closure of snare. Permit me to observe that we have men in this society who can do these operations in a manner incomparable and unexcelled.

But suppose after all one's painstaking care still too much bleeding follows operation. And unavoidable accidents may happen to any one. Your patient may be uncontrollable, your assistants untrained or unfamiliar with your method, and instruments may be faulty.

For instance, a loop of new snare wire used in a Tydings' snare proved to be too long to completely cut through the base of tonsil. Operation was finished with scissors—patient gagging—and posterior pillar button-holed; in the opposite tonsil a tonsillotome was used, mak-

ing a perfectly clean enucleation. This young man was certainly some bleeder, though a history of true hemophilia could not be obtained. And such definite histories are sometimes difficult to get. Perhaps there are degrees and gradations of hemophilia. At any rate, while both sides bled severely at the time of operation the one in which the snare was used and posterior pillar button-holed caused much the most trouble and anxiety for about three days, when all trouble stopped. Fully a week later while patient was sitting quietly and with no apparent cause, the opposite side burst forth in a most profuse spontaneous hemorrhage which defied the efforts of the attending surgeon for nearly twenty-four hours. Patient eventually made a perfect recovery and remained well, so that he may have been suffering from a temporary anemia or blood dyscrasia.

There seem to be a few such cases. The true hemophiliac must have the hereditary element and his blood must be constantly lacking in coagulating qualities throughout life.

In hemophilia or the hemorrhagic diathesis, the slightest injury or operation may induce hemorrhage that is controlled only with the greatest difficulty, fatalities having occurred from so simple a matter as the extraction of a tooth. Several personal experiences in cases that were in extremis the author would not care to have repeated, though all finally recovered.

A family of hemophiliacs were next door neighbors for several years, a typical family, the three children inheriting the trouble from the mother. The author will confess in confidence to you that it nearly caused him to have hematidrosis, or sweating of blood if you please, just to be neighborly; for some of their most trivial injuries and bumps caused hours of anxious treatment; those children were always starting something, and when we were all wondering if one would live or die they seemed to be enjoying their notoriety. One boy bit his tongue. It was only the slightest injury but it bled until his life was nearly despaired of, when glonoin and atropin were administered internally, immediately controlling the hemorrhage. These cases seem to have a thinness or brittleness of the bloodvessels as well as a lack of the fibrin ferment, or clotting properties in the blood. I know of no treatment that will permanently cure this condition. There have been several cases of fatal hemorrhage, or at least deaths following tonsil operations in my locality. Inquiry failed to develop the fact

of hemophilia. In one case faulty anesthesia seemed to be one of the causes of death though hemorrhage was quite profuse. But one must always be prepared for them. Since the history is not always easy to get, in doubtful cases some slight incision, such as loosening adhesions, will warn one of trouble. One of the author's cases, a hotel waitress, bled dangerously for hours from a preliminary incision less than ten millimeters long between the adherent tonsils and pillars. There was something about this girl that suggested the bleeder though it is hard to describe,—perhaps a certain mottled yet slightly pasty appearance of the face, something akin to the scrofulous diathesis, and an unusually moist condition of mucous membranes of throat, nose, etc. A precaution to be remembered is never to operate a female patient just preceding or during the menstrual period.

In treating these cases drugs act more rapidly and generally more effectively if given hypodermically. The sheet anchor here is probably horse serum administered subcutaneously, as one would give diphtheria antitoxin, and *this* may be used in the 500 or 1000 unit dose if pure serum is unavailable. This method is safer, quicker and fully as effective as the intravenous injection. The serum should not be too old and the dose is twenty c. c., repeated as needed.

Bleeders should have a preparatory treatment of three such doses a day for three days preceding operation (or of the Parke, Davis coagulose).

Four tablespoonful doses daily of limewater in milk has been used extensively for the same purpose, though it is of less repute than formerly as its action is uncertain. In any case, test such a patient out with some slight incision before performing a radical operation, for it is much better to be safe than sorry.

Parke, Davis & Co. are perfecting a dried-blood fibrin which is applied directly to bleeding surfaces, thus supplying the clotting property. I can give no personal experience with this as yet but the idea looks good and is credited with being useful. They call it coagulose.

Drs. Kahn and Jordan, of Chicago, in January *Journal of A. M. A.*, advocate the use of pituitary extract, injecting twelve minims subcutaneously twenty minutes before operating. They observed a reduction of from one-third to one-half in the time of coagulation in turbinal and throat operations. Their series of one hundred cases were all but three between the ages of four and twelve, rather young

for turbinotomies and not conclusive as to tonsil operations, for it would not seem unusual or extraordinary for the busy throat surgeon to have a series of that many tonsils and adenoid operations in younger children without one serious hemorrhage.

But if pituitrin proves as useful as a coagulant in adults it has the advantage that anaphylaxis would not be produced, as might occur where horse serum is used. That advantage would also obtain where the injection of 20 c. c. of fresh human blood or blood serum is employed, as advocated by Curtis. He uses a glass syringe, the inner surface lubricated with sterile petrolatum, and injects subcutaneously. Curtis believes this method is a good substitute for transfusion and in the treatment of anemias, and the technique is very simple.

In post-operative anemias following blood-loss, cinchona 2x seems to exert a remarkably salutary influence. *Geranium maculatum* and *hamamelis* all may be indicated in hemorrhages of moderate severity. As a specific in desperate cases and where the blood seems lacking in clotting qualities *Erigeron Canadense* is par excellence the remedy of choice, and it has saved many a desperate case. For palatability prepare oil of erigeron, one part with six parts tincture cinnamon. The dose is 6 to 8 minims on sugar, a dose one-half to two hours apart.

Digitalis was the means of saving one boy's life whose spontaneous outbursts of nasal hemorrhage had back of all valvular heart lesions. So each case must be carefully examined. In tonsillectomies adrenalin has been dispensed with by the author as not needed, and because of secondary hemorrhages. If hemorrhage is to occur it would seem far better to have it occur while prepared for it. The usual routine treatment for hemorrhage following throat operations would include medicated pressure tampons, dioxogen 1 to 4 of water being very popular, simple and effective. Any other astringent may be preferred, using ice water or other gargle ad interim. Examine your patient's throat most carefully in a good light and locate the source of bleeding. Should simple measures prove ineffective, ligatures applied as in hemorrhage elsewhere or deep sutures—sometimes suturing the tonsil pillars over an astringent tampon—may be required.

The McReynold's tonsil needle-holder is a new holder for throat work, though a Matthews' or other pattern will answer every purpose. My difficulty has been in holding the patient rather than the needle. Bleeding patients are apt to be badly frightened and their relatives

HEAD HEMORRHAGE.

as well, and the surgeon must remain cool and resourceful. Since many patients won't hold still for suturing the tonsil, a tonsil clamp or hemostat such as Bettcher's or Corwin's (new) becomes a very valuable aid. Gauze saturated with some astringent may be tied to the clamp before applying. These measures with carefully selected internal treatment, as indicated, and keeping your patient in a hopeful mental condition should be uniformly successful.

The author has perhaps dwelt somewhat fully on the treatment of blood dyscrasias, but those have been the cases which have caused him a great preponderance of trouble.

In nasal hemorrhages the same general treatment holds good. In such operations as the submucous resection, turbinotomies and ethmoid curettement, where oozing is troublesome, in addition to adrenalin 1-2000 locally the use of pituitrin hypodermically should prove of value and shorten the time of operation. Post-operative hemorrhage from the nose is usually easily controlled by splints, gauze, packing or tape. Trouble is often experienced on removing the packing or splint by the setting up of not dangerous but annoying oozing. Dr. E. G. Linn overcomes this trouble by splitting the Good or Stevenson splint into six or eight layers and inserting between strips of dental rubber dam. With a slender-bladed dressing forceps the middle sections can be removed in twenty-four hours; the remaining sections a day or two later. The last section is removed by reaching well back and picking up the posterior portion and peeling it forward as you would a ribbon, thereby avoiding sliding the segment and with it the protective blood clot. The method is new and attractive.

For spontaneous nasal hemorrhage and where a splint is not required after operation the author has used for years, with much satisfaction to himself and patient, Lee's cordine, a twisted one-fourth inch wick of six strands saturated in 5 per cent. camphor-menthol solution in albolene. This oily antiseptic astringent is the most comfortable to the patient, the most effective, and the easiest removed without recurrence of bleeding of anything he has ever tried. It is easily introduced with forceps through the anterior nares. Tamponing the posterior nares with use of Belloque's canula or soft catheter I have found necessary only in operations under general anesthesia.

Time forbids discussion of hemorrhage in the eye or ear. In

closing the author expresses the hope that the discussion may bring out some interesting personal experience of our members.

No. 614 First Natl. Bldg.

Tobacco addiction. "Have not smokers undergone a noticeable moral deterioration in at least one particular? They have a callous indifference to the rights of others." [99. + per cent. have; there is certainly a strong tendency to such, which may fairly be attributable— if not to the drug—to this rooted self-indulgence of a sensuous delight.] "Few men quarrel with a hostess who does not offer them drinks, but all habitual smokers expect that, regardless of her own desires, she will let them smoke after dinner. Yes, and during dinner. How many, how few, stop to think or care whether their prandial cigarette would interfere with another's enjoyment of the meal? 'We gave up the fight against tobacco in our drawing-rooms long ago,' said a famous London hostess; 'we found it was a case of no smoke no men.'

"A gentleman is more annoyed at being forced to consult another's preference about not smoking than about anything else that could arise in social intercourse, and is often at small pains to conceal his impatience with old fashioned people who believe that they have rights which should be respected. . . . If a man must get drunk, we say he shall get drunk where he is a nuisance only to himself and others of the same mind. If a man feels the need of interlarding his conversation with obscenity and grossness, we say he may not compel us to listen to him.

"But a smoker may with impunity pollute the air, offend the nostrils and generally make himself a nuisance to others near him who do not practice [or like] his particular vice. Is this not a kind of moral obtuseness?" [Is not obtuseness proven if the smoker cannot see that the habit carried to such extremes should be, let us say, deprecated?] —Charles B. Towns, "Habits that Handicap," rev. in *Med. Rev. of Rev.*, Jan. (q. v.), J. L. M.

REPORT OF A CASE OF EPITHELIOMA OF THE LOWER EYELID.

SEYMOUR B. MOON, M. D.,

Pittsburgh, Pa.

MR. THOMAS Q., SR. Age 57. Born in England; a coal miner by occupation; has a family history that is good.

He was admitted to the Pittsburgh Homœopathic Hospital as a staff patient on September 8, 1915. Ten years ago a small growth having the appearance of a wart was noticed on the lower lid of the right eye. A year or so later he was exposed to severe cold weather and parts of his body were frozen—including the wart. It left at once but reappeared two years later, and continued to grow for a period of seven years, finally breaking down and leaving an ulcerated surface.

When the case was first seen this ulcerated area involved the outer two-thirds of the lower lid and the outer third of the upper lid, extending downward on the cheek for four cm., somewhat triangular in shape. This area was surrounded by a hyperemia and hypertrophy of the skin for 3 or 4 cm. more, while the bulbar conjunctiva, extending from the temporal half of corneal periphery to the outer canthus, was in a state of papillomatous degeneration. The outer two-thirds of the lower lid being destroyed, a plastic operation became a necessity.

On November 7, 1915, accordingly, a Dieffenbach operation was done without involving the inner fourth of the lower lid, thus leaving the punctum and canaliculus undisturbed. In a week union had taken place and the triangular area of exposed surface on the cheek was granulating normally. A shrinking of the flap reduced the size of the lower lid one-third and a few days later the lines of incision began to break down, the epitheliomatous process progressing rapidly.

Ten days after the plastic operation radium treatments were begun by Dr. Frederick Proescher, and continued at intervals of a few days until December 27, 1915. In all, ten applications of radium were made, each lasting five hours, and the quantity used was fifteen milli-

grams—in the form of a flat varnished applicator (one square inch in size) without a screen.

At present there is no macroscopic evidence of the growth. The conjunctiva is normal in appearance. The upper third of the lower lid is absent (due to retraction of the skin flap), the length of the palpebral fissure is shortened one-fourth. There is no discharge from the eye and the tears pass off through the natural route. The condition presents every evidence of a cure. The skin is normal in appearance and upon close inspection the lines of the incision can scarcely be traced, there being the least scar-tissue I have seen following a plastic operation. The patient was discharged from the hospital Dec. 6, 1915, vastly improved.

What constitutes a cure? S. R. Geiser, M. D. In this day of cults, fads, fancies, and a multiplicity of healing methods, it is very difficult, in many instances, to determine what really constitutes a cure, and what per cent. of alleged cures are coincidences.

As we likely know, the word "cure" is a misnomer. Its actual meaning is "care" and has no reference to recovery from illness, and when I refer to a "cure" or a "recovery," I have in mind such a disease that became normal or at least very much improved, and so remained, by the application of some remedial agent; one that would not likely subside by a natural process, and had been determined by correct diagnosis, at least so far as our inadequate diagnostic methods and ability to apply them, would permit.

PLATANUS OCCIDENTALIS. A REPORT OF FIVE CASES.*

W. H. WILLIAMS, M. D.,

Middletown, O.

AT the last meeting of this Society a paper was presented on the drug *Platanus occidentalis*, "The Lancet of the Eye," bringing forth the properties of the drug to remove and cure chalazia. During the discussion which followed it was the consensus of opinion that it would be better if we could have distinct case reports on the use of this drug rather than a general statement of facts.

As there come to all of us patients who refuse operation, I determined to try the remedy on those patients with chalazia who refused to have their trouble removed surgically. And so at the suggestion of our President I beg to present these five cases; first, to make a report on the drug and, second, to bring the subject before the Society again that others may be heard from.

CASE I.—Dec. 23, 1914. Betty Louise, age 3 years. About two years ago parents noticed two small growths on the lower lid of the right eye, one about as large as a split pea and the other about half that size. The growths were firm and seemed to be attached to the tarsal cartilage with the skin freely movable over them. Conjunctiva of the lower lid congested. Gave *Platanus occid.* gtts. iij, t. i. d.

Was called to see the case about two weeks later and found that the chalazia were somewhat softer but that there was an acute inflammation of the upper lid, having the appearance of a sty. Fearing some irritation from the drug I discontinued it for about a week. Most of the inflammation on the upper lid had subsided by this time so *Platanus* was given again, but only one drop b. i. d. It was continued in this way for almost four months; then it was stopped as the medicine was all gone and parents thought the chalazia removed. I saw this case again in April; only a small thickening remained of the chalazia.

*Presented at the Annual Meeting of the O., O. and L. Society, Chicago, June, 1915.

The sty of the upper lid gradually disappeared also. Continued Platanus θ gtts. ii, t. i. d.

CASE 2.—Wm. C., 13 mo. Jan. 12, 1915. Case presented with a small growth on the lower lid of the left eye which the parents had noticed for the past two weeks. Growth was about the size of a small split pea and had all the characteristics of a chalazion. Gave Platanus θ gtts. j, t. i. d.

Jan. 19, 1915. Parents returned for more medicine with a favorable report. Increased dose to gtts. ij, t. i. d.

Did not see this case until April 15th. At that time the growth had entirely disappeared, and on palpation but a slight thickening could be felt. Continued the drug.

CASE 3.—Miss K. Age 26. Saw this case first on Feb. 27, 1915. There were two growths, each about the size of a pea, on the lower lid of the left eye. Each one was firmly attached to the tarsal cartilage with the skin freely movable over them. These had been growing for the past three months. Gave Platanus gtts. iii, t. i. d.

March 22. The smaller of the two cysts seemed to be leaving. The larger one about the same.

April 1. An acute inflammation with much edema had set in about the larger cyst, with a yellow spot in the center as though it would point and break through the skin. Continued the drug, but in 2 drop doses.

April 6. The redness and edema had almost left but cyst still had the appearance of rupturing through the skin.

April 30. At this time the smaller cyst was about gone, but patient said it had ruptured through the conjunctiva. The larger one was about the same as before. Patient had discontinued treatment because last prescription did not have quite the same color and taste as before.

CASE 4.—March 30, 1915. H. S. Male. Age 22. Small tumor on lower lid of right eye about the size of a pea, attached to tarsal cartilage but not to skin. Platanus gtts. 4, t. i. d., were given.

April 30. Tumor somewhat softer and smaller. Patient now desires same removed surgically.

CASE 5.—Mrs. M., age 39. Small tumor on left lid about the size of a pea of about two months' duration. Diagnosis, chalazion. Platanus θ in 4 drop doses, t. i. d.

PLATANUS OCCIDENTALIS.

April 30. Tumors at this time are somewhat softer and slightly reduced in size.

These conclusions are not given as final but from this little experience I am led to conclude the following:

- That Platanus will soften and remove chalazia,
- That it acts better in children than in adults,
- That it must be persisted in for a long time.

Whooping cough, measles, and scarlet fever. The principal epidemic maladies of childhood—whooping cough, measles, and scarlet fever—were together responsible for no fewer than 15,617 deaths of both adults and children, or 23.7 per 100,000, in the registration area in 1914, the rates for the three diseases separately being 10.3, 6.8, and 6.6, respectively. In 1913 measles caused a greater mortality than either of the other diseases, but 1914 whooping cough had first place. In every year since and including 1910, as well as in several preceding years, measles has caused a greater number of deaths than the much more dreaded scarlet fever. The mortality rates for all three of these diseases fluctuate greatly from year to year. The rates for measles and scarlet fever in 1914 were the lowest in 15 years, while that for whooping cough was considerably above the lowest recorded rate for this disease, 6.5 in 1904, although far below the highest, 15.8 in 1903.—*Bureau of the Census, Washington.*

ABSTRACTS.

A Psychological Analysis of Stuttering. The following is a summary of an article by Dr. Walter A. Swift in the *Journal of Abnormal Psychology*, Oct.-Nov., 1915.—My psychoanalysis reveals stuttering as some vague trouble in the personality. Psychological Analysis shows stuttering is an absent or weak visualization at the time of speech. This new concept of stuttering as faulty visualization may be called Visual Centre Asthenia. This lack of weakness in visualization accounts for all the numerous phenomena of stuttering in severe, medium, or mild cases. A new treatment is indicated.

Can the Speech Present a Sign of Congenital Syphilis? Walter B. Swift (*Boston Medical and Surgical Jour.*, Oct. 21, 1915) claims that congenital syphilis can cause a faulty or incomplete development of vocal cords that results in vocal monotony and harshness in both conversation and weeping. As spirochetosis has been of late offered to cover all the lesions of syphilis, I propose as a name for this sign scaphoid vocal cords and spirochetotic harshness.

The Form of the Reflexes in Chorea. W. B. Swift, (*Albany Medical Annals*, Sept., 1915). Shaw is confirmed in his observation on a single reflex in chorea—the knee jerk. The present contribution shows a reflex form that may appear during the elicitation of any of the normal reflexes. This form of reflex is really so peculiar as to amount to a sign of chorea of equal dignity with the respiratory signs of Graves and the new voice sign in chorea. The form of the reflex consists in an enhancing, retarding, or otherwise varying of the normal form of the reflex. It may therefore in brief be described as the jerk-flop-wobble form of reflex response. It is any change of reflex motion caused by a choreic contraction.

It occurs most frequently in the medium severe cases; and as a whole probably about once in five cases. In previous literature it was first observed in the knee jerk alone by Shaw. My contribution portrays its form in detail; and shows it may be present in all the other normal reflexes.

ABSTRACTS.

Observations of the Voice in Tabes—A Voice Sign.—Walter B. Swift (*Amer. Jour. of Insanity*, Oct., 1915) states that a case of tabes with lesion located mostly in the bulb, showing a marked speech defect of inco-ordinate articulation important enough to interfere some with business, is treated by a series of vocal co-ordinating exercises and is relieved. This renders his occupation easier. He considers himself "one-third cured."

Double Papillo-œdema—Optic Neuritis.—Sattler (*J. of O., and O-L.*, Aug., reprinted from *Lancet-Clinic*) emphasizes the necessity of early seeking and discovering this condition; also to advise, in every probable case, surgical treatment for the primary intracranial lesion at the earliest practical opportunity; this alone offers the only hope to stay or relieve impending blindness.

The many theories of the cause of this symptom have been found wanting, as they furnish only inadequate solutions of the many intricate questions involved. Our conceptions of a relatively normal intracranial tension are far from being established on a sound footing and must still be considered purely arbitrary ones. We have no reliable standard of, and cannot measure volumetric variations of the skull contents. According to the mechanical theory, if the lamina cribrosa is bowed toward the interior of the eye the case is pronounced one of active exudative optic neuritis; if this is not discovered the diagnosis is a simple œdema.

DISCUSSION (Cincinnati Academy of Medicine).

DAVID I. WOLFSTEIN: The "mechanical theory," which is usually accepted, does not satisfactorily explain the accompanying intracranial pressure. The "inflammatory theory," so far as papillo-œdema is concerned, is no longer tenable. The presence of a toxic process is not well established. The papillo-œdema is due—not to the presence, size or site of the tumor, etc.,—but to the interference in each particular case with the secretion, absorption and disposal of the brain liquor.

WM. RAVINE: Not rarely bilateral choked disc comes on very acutely (with headache and other symptoms) when it is due to serous meningitis or pseudo-tumor. Lumbar puncture will usually relieve these cases.

SAMUEL ZIELONKA called attention to Trotter of London's work.

on acute and chronic subdural hæmorrhage, which may be of some value in determining why optic neuritis is present in some cases and absent in others. In the living state brain tissue, under a fairly great degree of intracranial pressure, may be displaced or deformed but cannot be compressed. Choked disc is more frequent in cerebellar lesions because a very slight increase of pressure under the tentorium makes itself known, especially if acute.—J. L. M.

The Early Diagnosis of Mastoiditis.—John J. Kyle, *J. A. M. A.*, Aug. 7, 1915. Dr. Kyle is of the opinion that there is no experience in the life of the otologist more pathetic than to be called in consultation a few weeks after the onset of an acute purulent inflammation of the middle ear, to find a patient with recurrent chilly sensations, temperature 100 to 105 degrees, anxious expression, clammy skin, symptoms of lateral sinus involvement, or to find the patient with a rapid pulse, high temperature, headache, contracted pupils, anxious look, often delirious and sometimes with symptoms of meningitis. In either instance, the prognosis is grave, more so in the latter than in the former; hence, I want to go a little further and discuss indications for early operation and who should operate.

In this instance he says, the earlier a case of mastoiditis is detected and given operative treatment, the earlier and more complete the recovery and more positive the preservation of normal hearing during the life of the individual.

There is a remarkable number of cases of so-called catarrhal deafness and middle ear sclerosis that apply for treatment, that show scar-tissue and evidence of a discharging ear at some time, in many instances the early occurrence of the disease having been forgotten. There are numerous patients with partial or complete absence of the drum-membrane and ossicles the result of suppuration and healed mastoid, with progressive deafness, many of whom come for relief at the productive period of life and are from an economic sense dependent upon good hearing. He also finds that because of the prevalent indifference both among physicians and the laity to a chronic discharging ear, operation will be submitted to only when there is pain or one of the complex symptoms of chronic mastoiditis drives them to consult an aurist. Furthermore, that only a few appreciate the uniform good

results in the hands of a man skilled in surgery of the mastoid. On the other hand, physicians or surgeons who attempt the operation should do so only under exceptional conditions. Some of the bad results that frequently follow operation by those not familiar with surgery of the mastoid are deformity, slow healing, often extended over a number of years, facial paralysis and persistent discharge from the auditory canal. Such a series of bad results can be almost completely overcome by educating the public to a knowledge of the successful results obtained by the skilled aurist over the general surgeon, who has performed but few such operations.

The surgery of the ear, nose and throat owes its advance to skilled men and specialists in these regions and no one not prepared for such work by a killed preceptor should be permitted by public opinion to undertake major operations. The author in his lectures to a senior class says he ignores entirely any reference to surgical technic of mastoidectomy, and dwells upon the symptoms and diagnosis of mastoid disease, because the student should not be imbued with the idea that the day he enters the profession he is qualified to do such operations as a gall-bladder, a thyroidectomy or a mastoidectomy.

During the past winter the writer operated several cases in which the surgeon had failed by lack of special training. One case was an attempted cure of a chronic mastoiditis with cholesteatoma by doing a simple mastoidectomy; and a second was a Wilde incision for the relief of an acute purulent mastoiditis.

The foregoing serves to recall some of the early symptoms of mastoiditis, and the good results which attend early surgery by specially trained surgeons. He asks, when does a case of mastoiditis become an emergency operation? As soon as the diagnosis of acute mastoiditis is established, though all patients will not submit to operation and some cases will apparently recover without it. The cases that recover most rapidly after operation are those in which operation is done before bacteria have invaded the serous or seropurulent exudate.

Spontaneous recovery of an infected mastoid is likely at some future time to be the focus of a new infection, operation for which shows an unusual amount of cell-obliteration from old inflammation. The absence of, or the few bacteria in the secretion in the beginning or after early paracentesis is favorable to quick recovery, but a mixed

infection means a probable invasion of the antrum and mastoid cells, and the more tension of the pus in the middle ear, shown by pulsation of the drum membrane or the pus as it flows through an opening in the drum membrane, the more likely is the involvement of the mastoid cells and the more certain the indications for early operation. Temperature after rupture of the pus disappears quickly, and if it persists the mastoid is involved.

Pain on the mastoid may be present or absent, but pain in some region of the head on the affected side is generally present.

The two most valuable signs are pulsating discharge and temperature; even with these the case may go on to spontaneous cure; however, these two symptoms alone suggest early operation.

Continued pain on the affected side of the head with history of discharging ear at some time, with or without temperature, is highly suggestive of a diseased mastoid.

Blood examination is of some diagnostic value, especially where vaccine therapy may be contemplated.

The value of the Roentgen ray is in Dr. Kyle's opinion beyond dispute and should be interpreted by the otologist instead of the roentgenologist, whose clinical experience in most instances is only sufficient to say that the mastoid is abnormal, and who cannot tell by comparison with the normal mastoid whether it is filled with hæmorrhagic exudation, pus, cholesteatoma or sclerosed bone. The position of the head will govern the value of the picture; it should be inclined at an angle of 25 degrees, and it is necessary to take a picture of both mastoids for comparison; cells showing only cloudiness may be detected in this way, also process of spontaneous recovery after healing of the drum membrane, remaining exudation in the cells with beginning sclerosis of the cells or eburnation. This pathologic change eventually produces deafness, at first slight and later becoming perceptible, with loss of both air and bone conduction. A number of interesting mastoid conditions are shown in the twelve roentgenographs that accompany this valuable paper.

COMMENT.

Dr. Kyle voices the experience of practically every otologist when he calls attention to the great number of cases of so-called catarrhal

deafness and middle ear sclerosis that apply for treatment for progressive deafness, showing scar tissue in the drum membrane, perforations small and large, or complete absence of the drum membrane and ossicles due to one-time suppurating mastoiditis. To these may be added another type which includes the chronic mastoiditis with constant or intermittent discharge.

It is indeed a great pity, since the number of these cases could be reduced to a minimum if the proper steps were taken at the right time. For this failure the general practitioner is largely at fault, because of indifference probably induced by lack of knowledge of the subject, when he neglects to warn the patient of the seriousness of his condition. Then, too, there are those of the laity upon whom any amount of warning would be of no avail until grave complications have manifested themselves. Again, I am sorry to say, the diagnostic skill of the otologist is not all it should be in some instances.

The good results obtained by operative treatment in the hands of one skilled and specially trained in otologic surgery is an old story, but the insufficient and bad results so frequently found as results of the efforts of the general surgeon in operation on the mastoid is ever new and interesting, as in the instances quoted by Dr. Kyle, showing in the general surgeon a woful lack of special knowledge of the anatomy and pathology of the ear and mastoid region. This was particularly impressed upon me not long since while listening to a talk on "Operation of the Mastoid," by a general surgeon and teacher of anatomy. There is also a class of patients who will refuse operation regardless of the seriousness of the affection. Among these may be considered a recent case in my own practice.

A middle-aged man—according to his history—had been having typical symptoms of mastoid involvement for three weeks or more, at the onset of which he consulted a physician who saw him two or three times in this period, gave him some medicine and said the patient was doing nicely and would soon be all right; but instead he grew worse. He then consulted a wide-awake young physician, who in turn called me in consultation.

Upon examination I found a temperature of $99 \frac{4}{5}$, cold feeling in the evenings and extreme tenderness to palpation on the mastoid over the antrum. The bony portion of the external canal was swollen

and red; the drum membrane was swollen, red and pulsating—no special bulging. Paracentesis was done followed by a profuse pulsating muco-purulent discharge. I considered it advisable to study the case under conservative treatment before suggesting operation. This was done for three days with the following results during this period: Pain over the antrum decreased, drum membrane assumed a more nearly normal position and patient much more comfortable, and satisfied with his progress. On the third day, after noting the daily evening exacerbation of temperature, $99\frac{1}{5}$ to $99\frac{3}{5}$, some remaining tenderness in the region of the mastoid antrum, impaired mobility of skin over the mastoid and pulsating yellow pus from the opening in the drum membrane, feeling assured that operative procedure was best suited to the welfare of the patient as to quick results and against a long-lasting disease-process, possible complications and future impaired hearing, I suggested operation.

This was refused after deliberation, but the patient said he would continue with local treatment, which he also failed to do, at least with the writer. He did however receive the local treatment from another physician, as I have since been informed, and inside of three weeks there has developed a well marked facial paralysis on the side corresponding to the diseased mastoid, which the physician insists will disappear under local or conservative treatment.

In many instances, with the general practitioner, the only recognized signs of mastoid abscess are those over the mastoid. The danger in this is self-evident when one considers that there are a number of cases absolutely without post-auricular or mastoid manifestations, as in a primary mastoid abscess following a long since healed suppurative otitis media, and those of tuberculosis, inanition, etc.

GEORGE J. ALEXANDER.

Tonsillectomy and Illustrations of Operation With Special Knife.—S. Maimon Samuels. *Northwest Medicine*, Oct., 1915. In briefly outlining what the author considers some of the important factors essential to a successful tonsillectomy, and incidentally introducing a special knife, he lays stress on four points which he considers of particular importance.

1. The pillars must be guarded against injury. In children the

anterior pillars are as thin as paper, and injury will cause scar and shortening of space between the base of the tongue and the soft palate.

2. The operation must result in a complete removal of the tonsil with the capsule, otherwise the cause for removal still remains. The way to tell if it is complete is by examination of the tonsil.

3. The control of hæmorrhage. After entering the tonsil the blood vessels have only one coat, the intima, which maintains the lumen. This wall becomes directly connected with the glandular tissue and forms a part of the tonsil; for this reason hæmorrhage is profuse because the contractile power of the vessel is missing in the absence of the muscular coats. But in removing the capsule the vessels retract into the muscle tissue; thus aided by compression the tendency to hæmorrhage is reduced. Loss of blood must be prevented, as speedy recovery depends on small loss of blood.

4. Speed in operating is essential but not paramount. With speed a complete anæsthesia is unnecessary.

The special knife that the author introduces has on one end a sickle-shaped blade, sharp on its convex and concave edges. The other end is semi-cutting, broad and flat, convex edge at end and curved on the flat.

He divides his operation into four steps. (a) The tonsil is grasped with a forceps and traction made medianward to outline the membrane that connects the anterior pillar with the tonsil. Then a vertical incision is made at the margin of the anterior pillar with the back or convex sharp edge of the knife; this brings the capsule into view.

(b) He introduces the point of the tonsil knife under the retracted pillar into the capsule and with the concave cutting edge he cuts away the anterior pillar close to the tonsil; it is then directed backward and downward until the posterior pillar is free.

(c) The broad blade or end, "the enucleator," is introduced between the anterior pillar and the capsule of the tonsil and carried back to include the posterior pillar; thus by forcible dissection the tonsils and pillars are freed one from the other.

(d) His last step is to slip a No. 7 piano wire snare over the tonsil, gradually tightening the loop by use of the set screw until the tonsil is removed.

The advantage claimed by the author for his special knife is that

it avoids interruption for change of instruments and saves time, in this way preventing obstruction to the field of operation by blood.

COMMENT.

In my experience it is only occasionally that one finds the anterior pillars especially thin in children. There are two conditions that may be said to govern their presence.

1st. It is characteristic of a few.

2nd. There is either no inflammation or a mild disease exists in the tonsil or it is peculiarly confined to the tonsil.

Thick pillars are more apt to be the rule, made thus by the same disease process that involves the tonsil, plus adhesions and connective tissue bands from old or repeated attacks of inflammation; and the submerged and flat types of tonsils are especially prone to be associated with thick pillars.

Shortening of the distance between the soft palate and base of the tongue is frequently produced by healing of the fossæ or the stump from which the tonsil was removed, especially in the hands of an expert operator where the pillars positively have not been injured. On the other hand injury to the pillars will sometimes occur with the most expert operator under certain conditions; for instance,—in cases where the disease process includes the pillars, tortuous adherent prepuce and when operating under general anæsthesia.

Again the fossæ will heal perfectly flat without an apparent vestige of a pillar anywhere. This is usually in flat, shallow, submerged or badly diseased friable tonsils, and there are instances where the fossæ will flatten by disappearance of the pillars while one is observing it. This is probably due to insufficient muscle fibers in the pillars.

Hæmorrhage and its control depend largely upon the anatomical distribution of the blood vessels, coagulability of the blood, and the operator.

Contrary to Dr. Samuels' opinion, and with due respect for same, I am convinced that it is necessary in the use of a general anæsthetic for children to be completely under its influence; that the swallowing reflex should be retained is an exploded idea. Complete anæsthesia facilitates speed, decreases the amount of hæmorrhage, and the danger of inhalation pneumonia is not materially increased, as previously con-

sidered, because protection from inhalation of blood is furnished by involuntary nerve centers, which when stimulated by the presence of blood in the throat closes the glottis of the larynx and causes respiration to be discontinued for a period long enough to enable the operator to remove the blood.

G. J. ALEXANDER.

Studies on the Localization of Cerebellar Tumors. III.—Posterior New Growths Without Nystagmus. Ernest G. Grey. *J. A. M. A.*

"The purpose of this study has been to determine the proportion of patients with certified subtentorial new growths who have shown no nystagmus previous to operative treatment.

"Practically all authorities agree that nystagmus is a valuable localizing sign in diseases of the posterior cranial fossa. To this category belong especially lesion of the cerebellum, the cerebellar peduncles, the vestibular nerves, the neighboring nuclei and the labyrinths. When general pressure symptoms suggest the presence of a tumor, nystagmus assumes more importance still, for it is recognized that the occurrence of this sign in a patient with symptoms of subtentorial new growth argues in favor of an extracerebellar or intracerebellar neoplasm. Stewart and Holmes hold that this sign is almost invariably present in every case of cerebellar tumor at one or another time.

"Occasionally, however, in patients of this type no discernible rhythmic movements of the eyes are found on repeated investigation. Though frequently other features of the examination suffice for purposes of diagnosis, there are instances in which the localization of an intracranial tumor in the posterior fossa is a very difficult problem.

"A case in point recently came to my attention. The patient was examined repeatedly and by different observers, but no suggestion of nystagmus ever was noted. The picture as a whole was quite obscure. A tentative diagnosis of subtentorial tumor finally was made from the rapid onset of pressure signs (advanced choked disks, areas of absorption and enlarged venous channels in the roentgenograms, etc.), and the history of some disturbances in gait. There were no further significant localizing signs. Operation disclosed a solitary, median tubercle of the cerebellum measuring approximately 3 cm. in diameter.

* * *

"The records used in this analysis are from patients with tumors in the posterior fossa who have appeared in the neurologic services of Dr. Cushing at the Johns Hopkins Hospital previous to September, 1912, and at the Peter Bent Brigham Hospital since that date. Most of the cases in the latter group were personally studied by me. Of several hundred such cases only those—fifty-one in number—in which the new growths were localized at operation or at necropsy have been used for this report. In addition, for purposes of comparison, the records of forty-one patients from the latter clinic with verified supratentorial tumors have been analyzed for the presence or absence of nystagmus.

"Practically all of the patients were studied by more than one observer. This method of checking up the routine examinations is significant, particularly for the patients reported as showing no nystagmus. * * *

"Of fifty-one cases of verified subtentorial new growths, there were eleven in which no nystagmus was discernible previous to operation. Nystagmus was absent in one additional case on repeated examination up to the day of exploration. For purposes of comparison these are presented in the accompanying table.

"The lesion concerned in eight of the cases was a glioma or a gliomatous cyst. In three there were tuberculomas, two being solitary. As regards the site of the new growth, it is seen from the table that they involved practically all portions of the cerebellum. Either the right or left hemisphere was affected as a whole or in part in six cases. The tenth and eleventh patients showed an involvement of both vermis and an entire hemisphere. In the twelfth the lesion affected the deeper, anterior portion of the vermis and the right lobe. It is noteworthy that in no instance was the cerebellopontine angle primarily involved.

"The degree of intracranial pressure differed widely among these patients. From a case with no measureable swelling of the optic nerve head and only moderate tension at operation, the pressure ranged to one with advanced choked disk and extreme herniation of the cerebellum into the spinal canal. * * *

"The records of two patients illustrate how nystagmus which has been absent during one period of study may appear in later examinations subsequent to a suboccipital operation. Patient 30,000 on the

second admission and Patient 367 on the second and third admission had characteristic rhythmic movements of the eyes. * * *

"In twenty-two" (with nystagmus) "the new growths were cerebellar; ten occupied a median position, while eleven lay in one lateral lobe. In one there were gliomatous cysts in both hemispheres. The size of the new growths varied greatly, from lesions with a diameter of a few centimeters to growths which replaced most of the cerebellum. An extracerebellar tumor was found in each of seventeen patients. Of these tumors thirteen occupied a unilateral cerebello-pontine site and three a posterior, median position. In one additional case an infiltrating glioma of the vermis lay partially exposed in the posterior median sulcus.

"The degree of intracranial pressure in this group was found to vary within wide limits. In several instances the eye-grounds appeared to be practically normal. Operation disclosed only a moderate tension of the suboccipital structures. In the balance of the cases, on the other hand, the changes in the optic nerve-head varied from a few diopters swelling to an advanced choking of the disk. A number of the patients showed marked secondary atrophy. At operation corresponding differences were noted, in the degree of internal hydrocephalus.

* * *

"Of forty patients with tumors situated anterior to the cerebellum, eight showed characteristic rhythmic oscillations of the eyes previous to any surgical interference. The new growths and their locations were as follows: one glioma, right occipital lobe; one glioma, right thalamus principally; one gumma, left temporal lobe; two cases of gliomatous cyst, one right and one left, parietal lobes; one solitary tubercle and one glioma, pons; and one hypophysial cyst.

"The caloric test was used on three of the patients—occipital lobe glioma, thalamic glioma, and pontine tubercle. In each a typical nystagmus appeared following the irrigation of either ear. * * *

"Seven of the patients were examined with the caloric test. Typical nystagmus appeared following the irrigation of each ear in six of these; unilateral thalamic glioma, frontal gumma, bilateral thalamic glioma, temporal endothelioma, endothelioma at foramen magnum, and parietal endothelioma. In the seventh—a pontine endothelioma—there was no response from either labyrinth. An involvement of the third,

fourth and sixth nerve nuclei probably was largely responsible for this, as voluniary conjugate deviations of the eyes was practically impossible in all directions."

COMMENT.

That eleven out of fifty-one cases of subtentorial tumor showed no nystagmus at any time before operation is a much larger percentage than we have been inclined to believe. It is possible this number would have been fewer if a constant watch had been kept on the cases. Cerebellar more so than vestibular nystagmus is prone to vary both in intensity and direction, within short periods of time. For instance, I have observed three variations within a period of twenty-four hours in a case of cerebellar abscess. In the case of meningitis of the posterior fossa the nystagmus is even more unstable than in abscess or tumor. Nystagmus might be absent for some time in the case of a centrally placed cerebellar abscess (in the vermis); even in this location when the tumor reaches a size capable of producing signs of increased intracranial pressure it is quite certain to produce nystagmus if not from the cerebellum itself at least from pressure in the region of the vestibular nerve or its tracts. Furthermore, in a case of glioma that begins more or less centrally in the region of the vermis and spreads bilaterally in a manner calculated to destroy both sides equally and simultaneously, nystagmus may be absent because of a balance that is maintained even though the balance may be one that means a suppression of function from destruction.

When studying a case where the symptoms and signs suggest an intracranial tumor, and especially of the posterior fossa, there is ever need for making most careful tests, not only of the vestibular but also of the cerebellar functions. These tests should be made either by an experienced otologist or with his assistance. I would add that the hearing function should also be very carefully tested by an expert. In recent years since the vestibular functions have been receiving so much consideration there is a tendency to neglect the hearing tests. That nystagmus should be present in a case of cerebellar tumor or abscess is no evidence that the nystagmus is of direct cerebellar origin, for in some cases it may be of vestibular origin due to the pressure of the infiltrated cerebellum on the eighth nerve in the cerebellopontine angle. In this case both branches are affected and with them the facial.

Tumors of the cerebellum in this region are perhaps easier to diagnose than tumors in any other part of the cerebellum.

Concerning the general pressure symptoms of intracranial tumors as noted particularly by the choked disc, there is no definite relationship, for in one case with a large tumor, especially infiltrating gliomas, the tumor may reach considerable size before any objective evidence of pressure is presented; another case with a tumor or cyst of relatively small size the objective evidence of pressure may be quite apparent from the start.

The size of the new growth appears to be less a factor in producing symptoms and signs of pressure than the rapidity of the growth. The more rapid the growth the earlier the signs of pressure. For instance, a small slow-growing tumor of the vermis may show few if any signs of pressure or characteristic focal signs. From a study of the cases reported by Dr. Grey in which the classical signs of cerebellar tumor, including the nystagmus, were absent, the greater number were of this type and location. In his Case 2320 the only sign mentioned by the author suggesting a cerebellar tumor was the "history of some disturbance in the gait." The tumor was a "tuberculoma of the vermis principally; right hemisphere slightly." (?) This case is more or less typical of the class. The author does not tell us that the patient showed any disturbance of gait upon examination, but merely gave the history of having had "some disturbance." Evidently there were no signs of equilibrium disturbance at the time of his examination else he would have mentioned it. This is significant for it shows that the diagnosis of the location of the tumor was not arrived at by any other signs typical of cerebellar localization. If a tumor is large enough to compress or destroy the nuclei of the vestibular nerves or their tracts to the cerebellum there should be evidence of nystagmus at some time in the process, even though we may observe the case very late after compensation has occurred, when we may fail to detect it. Even in this case if watched continuously for a long period the nystagmus is liable to recur for short periods. In more than one instance of cerebellar disease I have been able to detect a nystagmus with the ophthalmoscope that had not been recognized by an external examination. Furthermore, in cases of verified nystagmus noted with the ophthalmoscope the nystagmus may be inconstant. This leads me to

suggest that in cases of doubt the ophthalmoscopic examination of the fundus by the direct method is an excellent and accurate method of determining the presence or absence of rhythmic nystagmus. One precaution should be observed, and that is to have the patient look straight ahead and *not* to the sides.

In the two patients without nystagmus prior to decompression one of two interpretations is possible. One is that as time progressed the tumor had also, and had eventually destroyed centers or tracts that had not been reached prior to operation. The other is that the decompression operation determined the direction of least resistance and at the same time brought greatest pressure on the cerebellar surface at the margin of the opening in the skull, which was impossible before operation when the pressure was more evenly distributed.

In referring to the nystagmus in these two cases Dr. Grey mentions "the characteristic rhythmic movements of the eyes." This is a rather loose way of referring to a nystagmus of cerebellar origin. He does not refer to the direction, the plane, the length of excursions or frequency of the eye movements, and these qualities are of considerable importance in diagnosis.

In referring to the seven patients with extracerebellar tumors and showing nystagmus, Dr. Grey was satisfied with the caloric test alone, which is the least reliable test for determining the quantitative function of the vestibular nerve. He found in these seven cases of nystagmus positive function by the caloric test on both sides in six cases. This merely tells us that there was some function present but does not tell us just how much. Positive reaction by caloric test will persist in any case where there may be considerable impairment of function so long as it is not complete. The fact that Dr. Grey was able to elicit positive reaction by caloric test in six of his cases in spite of nystagmus proves my contention of the unreliability of the caloric test alone in any case of disease of the labyrinth, the vestibular nerve, its tracts or of the brain itself.

In the last paragraph on page 1344, and continued on page 1345, he mentions that "In one instance the fine jerking of the eyeballs was noticed only when the patient looked toward his right side." This is a very inaccurate method of examination for spontaneous nystagmus which has led many observers to false conclusions, a fact that I have

ABSTRACTS.

frequently drawn attention to, more particularly in a candidate's thesis on "Some Observations on Turning Nystagmus," read at the 1915 meeting of the American Laryngological and Rhinological Society, at Chicago.—G. W. M.

SOCIETIES.

ENDOWMENT OF \$500,000 TO AMERICAN COLLEGE OF SURGEONS.

THE American College of Surgeons begins the new year with an announcement that it has secured from its Fellows an endowment fund of \$500,000. This fund is to be held in perpetuity, the income only to be used to advance the purposes of the College. By this means lasting progress toward the purpose of the College is assured.

The College, which is not a teaching institution but rather a society or a college in the original sense, now lists about 3,400 Fellows in Canada and in the United States. Without precedent for swiftness of development it stands to-day a powerful factor both in the art and in the economics of surgery.

Primarily the College is concerned with the training of surgeons. But the significant fact in connection with the endowment just secured is that it has come from the surgeons themselves, inspired by a motive for better service to the patient. Ideals in the profession of medicine are living things. Probably no more convincing proof of this fact exists than the sacrifice which the surgeons of this continent have made willingly in order to raise this fund.

To begin with, these ideals are to find concrete expression along the following lines of activity,—

1. Since the whole problem of the training of specialists for the practice of surgery is the primary purpose of the College, the Regents propose at an early date to present a clear conception of the College to the undergraduate medical students of this continent. The Regents, further, will ask each senior student of this group who has in mind to specialize in general surgery or any branch of surgery to register with the College. As these students, then, serve later as internes and as surgical assistants, they will be requested to report these facts to the College. The College, in turn, will systematically seek information as to the ability and character of such men; and the information thus obtained becomes the basis of admission to Fellowship in the College.

In addition to this procedure, the Regents will insist upon the proper keeping of case histories, and they will endeavor to stimulate in these men in training right ideals of medical practice. In this program they ask the active co-operation of the faculties of the medical schools and of all practitioners of medicine.

2. Inasmuch as proper training in surgery is inseparably involved with the conduct and efficiency of hospitals, the College will seek accurate data on all matters which relate to hospitals. From time to time it will publish studies upon hospital problems, the purpose being always to be helpful to the hospitals. These publications, further, will inform recent medical graduates as to where they may seek adequate general or special training in surgery. To be concrete the College will deal with such problems as (a) the proper equipment for medical diagnosis, *e. g.*, well equipped laboratories for chemical, pathological, and X-ray work; (b) the proper forms for case histories and the facilities for keeping these records; (c) the management and the curricula of the nurses' training schools; (d) the specialization essential in any well organized hospital.

3. The College will ask the faculties of medical schools to consider the advisability of conferring a supplementary degree of proficiency in general surgery and in the various specialties of surgery.

4. The College will issue readable monographs, educational in nature, to the press, to the general public, to hospital trustees, and to the profession of medicine upon subjects of medical procedure and the whole meaning of fitness to practice surgery.

The entire impetus of the College springs from within its own membership. Necessarily that impetus implies reform. But there is a vast difference between reform preached at men and reform innate in the hearts of men which finds expression at their own initiative. Whatever impetus the College possesses, it originates among the surgeons themselves. It is not an extraneous force or an "uplift" movement. But rather, out of the widely divergent views on many subjects among the Fellows, the aims of the College rise as those time-tried aspirations which are inherently the basis of all that is valuable in the vocation of surgery. The purposes of the College are concerned directly with matters of character and of training, with the betterment of hospitals and of teaching facilities of medical schools, with laws which relate to medical practice and privilege, and with an unselfish protection of

the public from incompetent service; in a word, they embody those ideals which have stood the test of centuries. Upon these the Fellows are united. These are the ideals which each Fellow, single-handed, has endeavored to foster, and the expression of them to-day through the College comes as a sort of mass-consciousness of the whole body of Fellows. The splendid fact is that the Fellows have grasped in an instant the meaning of the College by a process of fusion and they have gladly made sacrifices for its success.

As one comes into wide acquaintance with the Fellows of the College and catches some fair notion of their earnestness, he sees the future of the organization not by means of logic. There is something more subtle and potent than argument. A determined optimism carries a momentum of its own. Without a logical process it seeks concrete expression; and, more than this, it really recreates circumstances through all shifts of weather or play of incident with a certainty not excelled by an utterly rational course. The Fellows of the College, in their widely scattered districts, fuse their consciousness of the organization with a splendid hope in their hearts to advance all that is important and valuable in the profession. This very attitude of mind is the first promise for the future of the College. It is a promise that admits of no defeat. It is a pledge of loyalty to medical patriotism which means loyalty to the public welfare exercised through intellectual sincerity and scientific accuracy. It means a safeguard to the public, for it indicates where honest and adequate surgery may be found.

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Editorial

AMERICAN VOICE AND SPEECH.

IT has been recognized for a long time by those who have studied the subject carefully, and are therefore best fitted to judge, that the average American voice is shrill and the speech careless, if not slovenly, compared to the voice and speech of the average Englishman. Furthermore, there is a lack of uniformity throughout the United States in the sounds given to the vowels and diphthongs appearing in words; in the accenting of syllables in spite of the accepted rules for accentuation. In some parts adventitious consonants are put into words; for instance, *idear* for *idea*; in other parts consonants that should be sounded are silenced. A notable instance of this last-mentioned mistake is the silencing of the final letter by the negroes and uneducated whites of the South.

It is generally accepted that the speech of the New England people is more nearly correct than the speech of those of other parts of the United States. I recall an instance where a tramp born and raised in New England astonished the natives of other parts with his quite proper English, in spite of the fact that he never had any schooling. This case is cited merely to show that the manner of one's speech is often a matter of location, of imitation, and of habit, and not necessarily one of schooling unless the teacher himself uses proper form in his manner of speech.

In Europe generally, and in France and Germany particularly, educators have been giving the subject of voice-culture and speech-articulation vastly more attention than it has received in America, excepting in a few sporadic instances. Anyone who has studied French from a conscientious native teacher can recall the painstaking efforts he put forth to teach the proper pronunciation, because he

recognized that in proper pronunciation lay the one great secret to the mastery of the French language.

Again, in studying German, no matter by what method, the words "Langsam und deutlich" will be found to recur again and again. This is not a lesson taught to foreigners only, but is drummed into the German children in their schools. I can recall in my earlier experience with the German language the many times when seeking information I would ask a child in preference to an adult. The child would answer "slowly and distinctly," the adult less so, no doubt due to the fact that the adult was less carefully taught in his day than the child is in this. What is good for France and Germany, the leading educational countries of the world, is likewise good for America, forgetting for the time being whether we are pro-Ally or pro-German.

The war of nations that is now raging in Europe has awakened in America the spirit of preparedness in more ways than one. This spirit is manifested in the military, the scientific, the manufacturing, the educational and the social life of the American people. From an educational and social standpoint we can have no more fundamental starting-point than that of speech. Our very thoughts even though silent are inseparable from language, and language uttered is speech. Speech again is fundamental to language and thought. Speech existed before the hieroglyphics—the most fundamental of written languages.

Appreciating the importance of the subject, The National Council of Teachers of English last year authorized the appointment of a Committee on American Speech, to be made up of teachers of English and of other persons concerned with voice and speech. The plans of the committee have been published in the *English Journal*, Volume IV, Number 9, 1915, and are well worth careful reading by everyone interested in the subject—and by others that they may have their interest awakened to the importance of the work now under way.

It is eminently fitting that this JOURNAL because of its special interest in the subjects of Otology and Laryngology should help to launch and give an impetus to the work of the "Committee on American Speech" by placing the entire space of one of its issues at their disposal.

The April number is therefore devoted entirely to the first general

symposium on the subject. The contributions have been prepared by well recognized authorities in their special fields.

To Dr. Burton Haseltine, the Associate Editor, is due the credit for having thought out the plan of the symposium. He with the able assistance of Professor John M. Clapp selected the authors and collected the contributions. The suggestion is offered to the subscribers to read the entire issue and if the subject appeals to them to join the movement.

G. W. M.

THE NEW AMERICANISM.

NATIONS, like individuals, have their biological periods of growth, maturity and decay. Whether the period of decadence is inevitable in a nation or whether the period of growth can be indefinitely prolonged is a still unsettled question. World history thus far argues strongly against the latter possibility. This however seems clear, that a nation can escape the decadent process only so long as a distinctly upward growth continues. There seems to be no lasting state of stable equilibrium.

The upward growth of commonwealths is observed to take place in three more or less distinct stages. First is the stage of rude materialism. In this there is scarcely more than the struggle for existence with little elaboration of life and little co-operation beyond immediate and obvious requirements. Organization is meagre and both individual and social life is relatively simple.

Second is the stage of refined materialism. In this stage we see the most complex and ingenious devices for the elaboration of life in a material way. Organization is intricate while individual and social life becomes wonderfully diversified. Material accomplishment in this stage is so dazzling that it is usually mistaken for a high state of civilization, whereas it may in fact mark the beginning of decadence. A misconception of this kind has wrought the ruin of many nations in the past and is surely a menace in our modern life.

The third stage of a nation's growth, which we may call the stage of intelligent idealism, is one as yet but partly attained and we can merely speculate as to its possibilities. Obviously it can be realized only by a nation raised by intelligent materialism to a high state of

physical well-being. If now the superabundant energy instead of forcing a too elaborate materialism, can be directed into idealistic channels, the possibilities for upward growth are almost limitless. This more or less vaguely has been the dream of many inspired statesmen, but little have we seen accomplished. Too often that which has seemed advancement has proved to be only sadly misdirected energy. The old world to-day is realizing the horrible results of a too ingenious and a too diabolical materialism.

America as yet appears to be more fortunate since we are still in the happier stage of refined materialism. No other nation has exemplified so rapidly and so perfectly the growth from the crude struggle for existence to a high state of physical welfare. Probably in no other nation is the average of physical accomplishment greater. Whether the next stage is to be one of intelligent idealism or of diabolical materialism, only God and the American conscience can determine.

Certain it is that the average trend of thought in America is toward less grossly material lines, that custom and usage in civic life have greatly improved in recent years. In spite of many discouragements it is undeniable that more wholesome ideals are finding expression.

In our commercial world the center of gravity has unmistakably shifted. The dividend is still a weighty matter but more and more attention is being paid to things not directly profit producing. The first evidence of this was the growing recognition both by the State and the Corporation of responsibility for the physical welfare of the individual. Out of this has come a concern for his less material needs and even a dawning regard for abstract ideals. Great commercial institutions as never before are helping to make more wholesome and more beautiful the land in which we live. The richness of human life is being considered as well as the richness of human pockets. May we not say, then, that there is coming to be in a very real sense an American conscience? Inarticulate as yet it may be, but destined to find expression and become more conscious of itself.

How fitting, therefore, and how timely that we should consciously strive for the establishment of a truly American and a worthy American speech. If it seems a far stretch from nation building to speech training let us remember that language is the strongest link that binds one people to another, and that without adequate expression

EDITORIAL.

no high idealism is possible. So long as Boston speech is unintelligible to denizens of the Ozark Range we are not a united people. And in truth, we have no common tongue. We have sectionalism in speech even more than in sentiment, and none of our many colloquial languages can measure up to any worthy standard. If the New Englander scorns the western twang he must admit that his greatest living authority has so abused our sturdy English as to say that "gone," "morn" and "dawn" are perfect rhymes!

From the Pacific Coast comes the nearest approach to correct English with unsullied diction, and only because we there have people who have been trained from childhood in artistic speech unhampered by the hereditary faults found in older communities. With this as a suggestion may we not hope to bring together the best from all our various provinces and out of it evolve a speech in which the future American may have pride? May not the average man of the new generation have a joy in the art of expression and may he not find in it an inspiration and a help for the utterance of that intelligent idealism?

BURTON HASELTINE.

PREFACE.

SPEECH, as the chief medium of human intercourse, plays an important part in every relation of human life. Improvement in the condition of the speech-apparatus, and in its effective functioning, will profoundly affect individual and community efficiency.

In the following Symposium, after the general survey of the subject by Professor Clapp, there is first a group of papers discoursing the structure and hygiene of the voice apparatus and its treatment when infected or diseased, by Dr. Rice, of Boston; Dr. Beck, of Chicago; Dr. Blanton, of the University of Wisconsin; Dr. Noyes, of Chicago, representing the dentists, and by Professor Gandell, a teacher of singing who is also interested in the problem of speech.

In the second part of the Symposium the relation of speech training to social and commercial efficiency is presented—so far as space permits—by Professor Scott, Supervisor Bachrach, and Principal McDade, representing the point of view of college, high school and elementary school, by Mr. Skinner for the stage, and by representatives of two large business concerns, one of which has for some years made instruction in speech a part of its employees' training.

Finally Dr. Haseltine notes the appearance of what we hope is the first of a new type of books, presenting the physiological and physical facts about the voice, carefully yet in simple terms, for the non-medical reader.

SYMPOSIUM ON SPEECH, VOICE AND HYGIENE OF THE VOCAL TRACT.

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THE REFORMATION OF AMERICAN SPEECH.

JOHN M. CLAPP, M. A.,

Lake Forest, Ill.

THE National Council of Teachers of English last year authorized the organization of a Committee on American Speech, to be made up of persons in various walks of life. The intention was to form gradually a large and representative body of men and women, throughout the country, who might co-operate in rousing public sentiment to the need and the possibility of improving the American speaking voice and raising the standard of speech-usage in daily life.

It is no news to say that the standard of speech among Americans is the worst in the civilized world. American utterance is a slovenly thing, as compared with English, French, German, Italian, Spanish, Russian, and South American. American voices are strident and harsh. We used to regard the fact as a sort of good joke, to regard concern about it as a special mark of the high-brow, the dilettante. Vast number of our people view the matter in this light still.

Many, though, have come to realize that our vicious speech habits are a serious handicap to national efficiency. They impair the speed and accuracy of communication, in business as well as in social life; they increase our liability to disease. Or, to put it the other way round, a general insistence on decent speech—distinct utterance and clear quiet tone—would not only make life pleasanter but would enable us actually to talk faster and be understood more easily, in all our business dealings. It would lessen disease, because it would promote better hygiene of the entire vocal tract—mouth, nose, throat, and lungs—among all persons, and because it would lead to the detection and correction of thousands of physical irregularities which now go unhelped and almost unnoticed. When a whole population says *cer'nly* and *mou'n*, for *certainly* and *mountain*, the victim of adenoids, of bad teeth, of cleft palate, is not likely to be caught and cured. Yet a people which has learned the importance of care of its teeth should not be

hard to convince of the importance of care of its utterance. The two things, in fact, are closely connected, as any dentist knows.

Now the strange yet encouraging fact is that our bad American speech-ways, our noisy harsh voices, are merely the result of careless habits, acquired unconsciously in childhood. Even in our catarrh-causing climate any one who so desires can develop an effective and pleasing speaking-voice, at little or no expense, in a short time. The climate is undoubtedly a handicap; people with catarrh have more trouble than others in keeping their voices right. But this difficulty has been greatly exaggerated. Right use of the voice not only promotes better hygiene of the vocal tract, but itself tends to lessen liability to catarrh. The essential in good speech is what is called "placing the tone," the right use, that is, of the resonance-cavities of the mouth and nose. This can be learned through very simple, gentle humming exercises. If these are practiced patiently, and applied in daily talk, the voice will be made over, almost unconsciously. Anybody can do it, anybody whose mouth and nose are not physically defective, and even these cases can be made right by medical or dental treatment.

Better teaching, by better trained teachers, in the elementary schools would free us from "the public misfortune known as the American speaking-voice" in a generation. Train up a child in the way he should speak, and when he is grown he will slough off whatever bad habits he may have picked up during adolescence. Better teaching would cost little more than we now pay. Other nations get more efficient work of this kind in their elementary schools, though they pay even less to their teachers than we do—not because their teachers are of better quality, but because public sentiment enforces a higher standard in this subject. In London a satisfactory course in voice training is required of all persons who seek appointment in the County Council schools. It is profoundly encouraging to know that the state of New York is beginning to move in the same direction by requiring voice training for high school teachers of English. To insist that teachers in public and private schools talk rightly themselves, and to see that they receive as part of their professional training instruction in the simple voice exercises which they are to pass on to the children, would be of great help. Such instruction, by the way, enabling the teacher to go through the long school day without hoarseness or tired throat, would be doubly beneficial.

Training the voice for public performance, for the work of singer, actor, orator,—like training the muscles of a gymnast,—requires a long time, and elaborate and varied exercises. As to the best methods there are and doubtless will always be widely differing opinions. Training the voice for the requirements of daily life is a much simpler matter. Regarding the methods of this elementary work there need be little dispute, and the gentle humming exercises at least furnish a foundation for special training later. Much of the special study of actors and singers must now be given to rooting out bad habits of daily speech. Better instruction in the lower schools, together with wise medical supervision of all children, would keep the future actor or singer from acquiring those bad habits.

Moreover, much can be done for adults. Individuals can do much for themselves if they will apply the principles of efficiency to their personal problem. Even in adults the power of adaptation, of unconscious as well as conscious imitation, is far greater than most of us realize. All of us talk better into the telephone, for instance, than at other times, though even our telephone utterance, business men know, is sadly inefficient.

Employers could exact better standards of speech from their employes—department stores, and commercial houses of various sorts, for instance, which are already giving their young people instruction in dress and manners as a part of the art of salesmanship. Some of the great French shops, it is said, regularly give instruction in speech to their young people. Improvement in clearness and accuracy of speech among employes would be directly profitable to employers. The records of telephone companies show that most of the delay and difficulty in the use of the telephone—the sixth sense of the modern business man—is due to the indistinctness or inaccuracy of the speech of the public. The telephone companies train their employes in utterance; they cannot train their millions of patrons.

The strongest influence upon adults as well as children is social pressure. Where a community is awake to the importance of this matter, where the schools are backed up in their work with the children, the standard among adults is good, throughout all classes.

And, happily, individuals and groups are waking up. The teachers of elocution and public speaking were for a long time almost alone in urging the need of speech-training. They are now adding to their

courses in interpretation and public speaking the instruction in "private speaking" which every one of us needs. The teachers of English, after long neglect, are beginning to give serious attention to the speech-habits of their pupils—as the existence of the Committee on American Speech shows. The normal schools, and the executives of large school systems, are generally interested. Many teachers of singing are looking to the utterance of their pupils as a preliminary to instruction in song. Among the actors a period of speech-neglect, following the decay of the old-time stock companies, is giving place to renewed care for diction, with the growth in influence of the new dramatic training-schools. Physicians, especially those concerned with the nose, throat, and lungs, and dentists, especially the orthodontists, are preaching to their patients the importance of vocal hygiene, and right speech. A beginning has been made on the part of business firms. The influence of the thousands of women's clubs in various ways promotes regard for better standards. More than one community has been "clubbed" into better support of enlightened school officials.

What is most needed now is co-operation among these various armies. Some way must be found to unify and concentrate their influence, so that the general public shall be roused. Co-operation would tell in various ways. School authorities would be supported in their efforts for the better training of children. Employers would be encouraged to enforce better standards among their employes. Public sentiment would be stirred in one community after another to the point of requiring clear and accurate speech just as it does cleanliness of person, and decency of dress.

The Committee on American Speech is a beginning towards such co-operation. It looks for no panacea for the various faults of American speech-usage; contemplates no propaganda for any one "system." Most of its members are being recruited outside the ranks of teachers. It seeks (1) to open communication among the various groups and individuals interested; (2) to aid in every way in rousing public attention; (3) to encourage all honest effort, anywhere, to improve conditions. Its aims are described, in part, in the following extract from a recent statement: "Adequate training of the speech, voice, and ear of the young American is of vital importance in our national culture. This training should seek not merely to secure the adequate development of those fitted to become singers, actors, public speakers, but

should seek above all things to improve the standard of voice and speech in daily life.

"This object can be attained only through the active co-operation of many classes of our people—ultimately, indeed, of all Americans. A systematic campaign should be set going in every community, and in the country as a whole, to unite the efforts of all interested classes in educating public sentiment. The Committee believe that the public is ready for such a movement."

The chairman of the Committee is Professor Fred. N. Scott of the University of Michigan; the vice-chairman, Professor John M. Clapp of Lake Forest College; the secretary, Professor Calvin L. Lewis of Hamilton College. Some of the members are: Among educators: R. M. Alden and George Hempl of Leland Stanford University; T. C. Trueblood of the University of Michigan; S. H. Clark of the University of Chicago; Samuel A. King of Bryn Mawr; F. W. Padelford of the University of Washington; Katherine Jewell Everts of the University of California; E. D. Shurter of the University of Texas; I. L. Winter of Harvard; J. F. Hosc of the Chicago Teachers' College, editor of the *English Journal* and secretary of the National Council of Teachers of English; Dr. S. S. Curry of Boston; Supt. R. J. Condon of Cincinnati; Supt. O. L. Reid, of Louisville. Among singers and teachers of singing: David Bispham; Shirley Gandell; Dr. Floyd S. Muckey; Wm. H. Neidlinger; Dr. Frank A. Rix. Among actors and teachers of dramatics: Otis Skinner; Edith Wynne Matthison; George Seliss; Leland Powers; Margaret Anglin; Donald Robertson; Professor George P. Baker of Harvard. Among physicians, and dentists: Drs. John E. McKenty of New York; George B. Rice and Frank A. Delabarre of Boston; Burton Haseltine; Joseph C. Beck, Frederick B. Noyes of Chicago; J. R. McCleary of Cincinnati; Smiley Blanton of Madison, Wisconsin. Among editors and writers: Arthur Brisbane. Waldemar Kaempfaert, Charles H. Towne of New York; H. C. Chatfield-Taylor, W. N. C. Carlton, Wallace Rice, Bert Leston Taylor of Chicago; W. M. Reedy of St. Louis.

As the Committee is an association of voluntary workers, its means, as also its time, are necessarily limited, and it must have recourse to the kindness of other organizations for aid in reaching the ear of the public. It has been thus indebted in the past to various publications, educational and other. In the present instance it is deeply sensible of

the energy and the public spirit of the editors of the JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY in arranging the following Symposium on Speech, Voice, and Hygiene of the Vocal Tract, the first systematic presentation of the general subject in America. It is a presentation, it will be noted, from the point of view of the "consumer." The contributors are not by profession teachers of speech; they are men who have become convinced, in connection with their own pursuits, of the importance of public agitation of the subject.

Agitation, to be widely effective, however, must be continuous. No group of voluntary workers can carry through a work of such magnitude, unaided. Some time—are we ready for it now? there must be an American Speech League, with a small but assured money support, which can keep at work all the year round, until the general public realizes what the contributors to this Symposium realize, and Vox Populi Vox Diaboli is no longer true of American Speech.

Lake Forest College.

THE VOCAL APPARATUS IN HEALTH AND DISEASE.

GEORGE B. RICE, M. D.,

Boston.

THE vocal apparatus consists of the larynx, the chest, and the resonant cavities of the head. A perfect voice can be produced only by the proper co-ordination of these structures in a normal condition, guided by a trained intellect, and a sensitive and cultivated ear.

The chest performs a two-fold task in the production of the voice; first, its bellows-like action, and second, its function as a resonance chamber. The delicate and complex larynx transforms breath into sound, and the resonance cavities add quality and carrying power.

Speech is articulated tone. Song is sustained tone, supplemented by the vibrations of air in the resonance cavities, above and below. A difference is found only in the sustained character and duration of tone. Correct breathing, then, is the foundation of both speech and song.

An understanding of the construction of the vocal apparatus; its physiology, and the common abnormal conditions which interfere with its proper use are essential to anyone who, by precept and example wishes to have a part in the "Society for the Improvement of Speech."

Let us, then, consider as briefly as possible these details. The larynx may be considered as an expansion of the trachea or wind-pipe; it makes in the neck the prominence popularly known as Adam's Apple. It is formed by the articulation of five principal cartilages; the thyroid or shield cartilage, the two arytenoid or pitcher-like cartilages, the cricoid or seal-ring shaped cartilage, and the epiglottis, resembling a leaf.

In addition there are two small cartilages, those of Santorini and Wrisberg, imbedded in the soft structures of the tissues which extend from the tops of the arytenoid cartilages to the sides of the epiglottis. These cartilages of the larynx are bound together by extrinsic and intrinsic muscles. The movements of the larynx as a whole are con-

trolled by the extrinsic muscles, while the intrinsic muscles change the relation of the cartilages to each other. The cavity is lined with mucous membrane, and stretching from the lower part of the arytenoid cartilage to points inside the thyroid, are two elastic bands, the vocal bands.

The arytenoid cartilages are the most important because, resting as they do upon facets formed upon the upper portion of the cricoid cartilages, they have a rotatory motion, and are also capable of considerable lateral motion. They are held in position by small ligaments, and are concerned in the opening and closing of the vocal bands. This act is accomplished by three sets of muscles: the lateral crico-arytenoid, the posterior crico-arytenoid, and the arytenoidii muscles. The further movements of the vocal bands are made by the crico-thyroid, or the tensor muscles, and by minute muscular fibres attached to the sides of the vocal bands, and inserted into the thyroid cartilage. Above the vocal bands is a fold of mucous membrane called the ventricular bands, or false vocal bands. In this fold of mucous membrane are muscular fibres. They, in conjunction with the epiglottis and aryteno-epiglottic fold, close the opening into the larynx on deglutition, thus preventing the passage of foreign bodies into the windpipe. Between the vocal bands and the ventricular bands is an elliptical opening, the *sulcus laryngis*, richly supplied with mucous glands, and having for its function the lubrication of the vocal bands. The larynx is abundantly supplied with bloodvessels, and motor and sensory nerves.

For position of cartilages and relations see Figs. I, II, III, IV.

The organs of respiration consist of a bony wall, ribs and costal cartilages, sternum or breast-bone, clavicle or collarbone, and the scapular or shoulder-blades. This bony wall is bound together by muscles and ligaments, and has the power to enlarge or diminish the thorax. The thorax, or cavity of the chest, contains the lungs and heart, with its enveloping membranes, and the bronchial tree, and is separated from the abdominal cavity by a flat series of muscular fibres, the diaphragm. The diaphragm is normally an involuntary muscle, acting passively as the chest cavity is contracted and expanded by the action of the respiratory muscles of the chest, and the action of the abdominal muscles. Whether the diaphragm can be converted into a voluntary muscle or not is a question yet to be determined. As has been stated, the chest cavity and the resonance cavities of the pharynx and head amplify sound. The accompanying diagrams show clearly

the resonance cavities of the pharynx and head. So further comment on these anatomical characteristics need not be made.

We must now concern ourselves on the mechanism of proper respiration. On the whole, as I shall attempt to show, the majority of teachers, physiologists, and great artists, are in accord concerning the importance of proper respiration in good singing and speaking, and are also quite satisfactorily united as to the means to this end, only

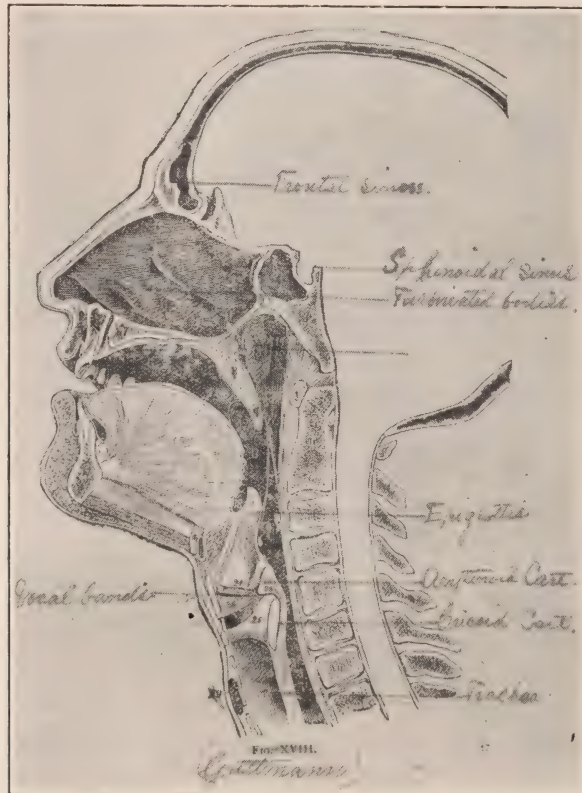


FIG. I.

this uniformity does not seem clear because of the different methods of explaining the subject.

The form of respiration which most adequately meets the demand of the public singer or speaker is what is known as the diaphragmatic type, although this term I think is a misnomer. Dr. Makuen, however, uses this appellation, and says he can feel his own diaphragm contract by what he calls the kinæsthetic sensation. Helen Keller, he states,

depends entirely upon the kinæsthetic area in her brain for guidance in her speaking and articulation. Physiologists tell us that this term indicates a sense of movement in a certain brain area, and that this acts as a stimulus to the true nerve centre.

In the *Laryngoscope* of April, 1910, appears an article on "The Diaphragm in Voice Production," by Drs. Boyce and MacLachlan, of Pittsburgh, Pa. These studies were made by the means of the fluoroscope upon professional singers, a clergyman, and non-professionals. Their observations would seem to prove that it is impossible to produce continued tone with the diaphragm in a state of contraction, for in all cases the organ on expiration would rise steadily in the thoracic cavity. Other observers have shown that the diaphragm

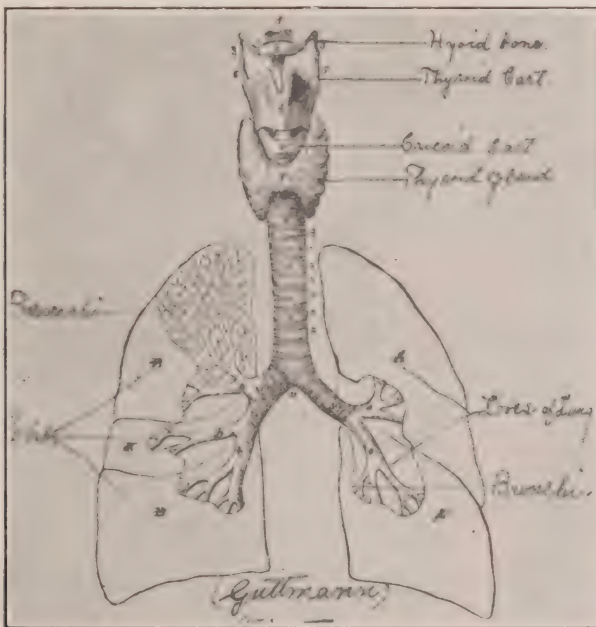


FIG. II.

is not a powerful muscular organ, but that it probably plays a more or less passive part in respiration.

Dr. F. Victor Laurent, a former opera singer, and an authority on respiration, describes the practice of the artistic type of breathing as follows: "Stand erect, with shoulders thrown back. Inhale through the nose with the mouth closed, filling the lower part of the lungs. The diaphragm descending will exert a gentle pressure on the ab-

dominal viscera. (The descent of the diaphragm is facilitated by pushing forward the anterior wall of the abdomen.) The contraction and descent of the diaphragm will cause the lower ribs to be pushed out, thus filling the middle part of the lungs. Then fill the upper portion of the lungs by raising the sternum and dilating the upper chest walls, at the same time drawing in the lower part of the abdomen. As soon as inspiration is effected, count in a low voice up to the number

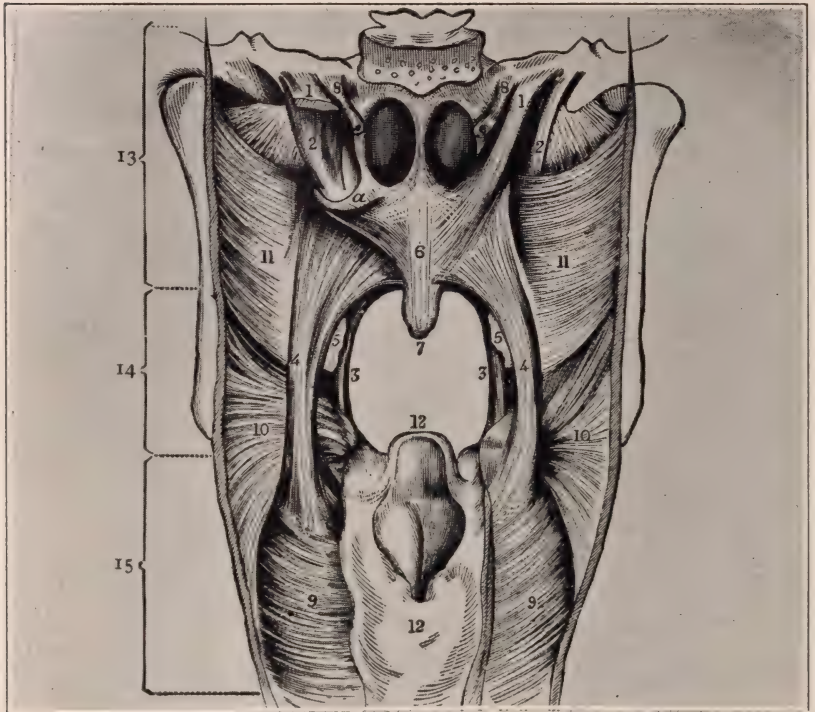


FIG. 12.—Muscles of the soft palate and pharynx. Pharynx laid open from behind 1, 1 levatores palati, the left being cut short near to its origin; 2, 2, *tensores palati* the left showing its reflected tendon and relation to the hamular process, *a*; 3, 3, *palato-glossi*, anterior pillars of the fauces; 4, 4, *palato-pharyngei*, posterior pillars of the fauces; 5, 5, tonsils; 6, *azygos uvulæ*; 7, uvula; 8, 8, Eustachian tubes; 9, 9, inferior constrictors; 10, 10, middle constrictors; 11, 11, superior constrictors; 12, 12, epiglottis and larynx, not laid open; 13, cephalo-pharynx or naso pharynx; 14, hyo-pharynx or oro-pharynx. (Gray, Browne and Burnett.)

FIG. III.

which can be attained without completely exhausting the breath, holding the chest in a firm position, and letting the diaphragm relax slowly."

Having once gained control of the muscles in respiration artistic

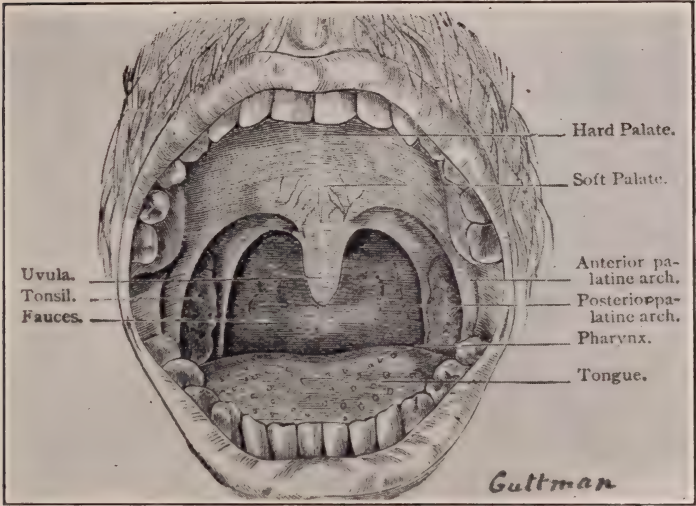


FIG. IV.



FIG. V.

FIG. 45.—Natural size. 1. Frontal sinus. 2. Frontal bulla. 3. Partition between frontal sinus and frontal bulla. 4. Eyeball. 5. Duct. 6. Middle turbinal (Onodi). 7. Maxillary antrum. 8. Inferior turbinal. 9. Inferior meatus. 10. Superior turbinal. 11. Opening of maxillary antrum. 12. Septum. 13. Palate.

breathing becomes almost as automatic as ordinary breathing, and one seems to sing and talk naturally and easily.

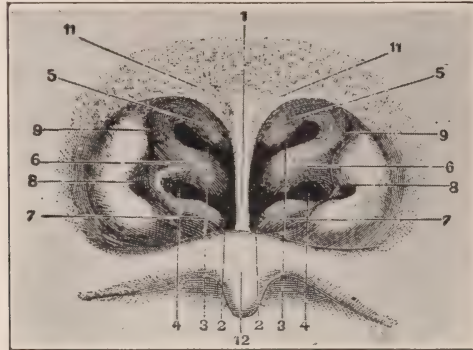


FIG. 31.—Rhinoscopic image. 1, vomer or nasal septum; 2, floor of nose; 3, superior meatus; 4, middle meatus; 5, superior turbinated bone; 6, middle turbinated bone; 7, inferior turbinated bone; 8, pharyngeal orifice of Eustachian tube; 8, upper portion of Rosenmüller's groove; 11, glandular tissue at the anterior portion of vault of pharynx; 12, posterior surface of velum (Seiler).

FIG. VI.

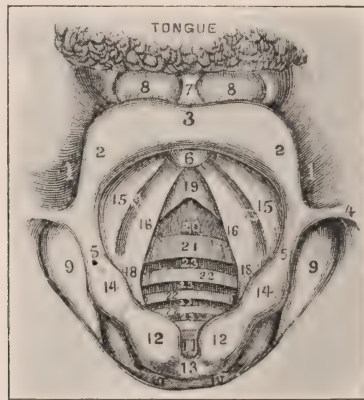


FIG. 34.—Enlarged sketch of normal laryngoscopic image in respiration, slightly forced to exhibit the chief cardinal points of observation in detail. 1, lingual surface of epiglottis; 2, laryngeal surface of epiglottis; 3, indented crest of epiglottis; 4, pharyngo-epiglottic fold; 5, ary-epiglottic fold; 6, pad of epiglottis; 7, glosso-epiglottic ligament; 8, lingual sinus; 9, pharyngo-laryngeal or pyriform sinus; 10, posterior laryngeal wall, terminating in a line representing the entrance into the œsophagus; 11, inter-arytenoid cartilage (Santorini); 12, supra-arytenoid cartilage; 13, inter-arytenoid fold; 14, cuneiform cartilage (Wrisberg); 15, ventricular band; 16, vocal cord; 17, ventricle (Morgagni); 18, posterior vocal process; 19, thyroid cartilage; 20, crico-thyroid membrane; 21, cricoid cartilage; 22, rings of trachea; 23, interspaces between the cartilages of the trachea (Cohen).

FIG. VII.

Dr. Frank Miller rightly objects to the term "diaphragmatic breathing," and prefers to use the words "artistic breathing." He

thinks that artistic breathing should consist of a combination of clavicular, abdominal, and costal, and this combination, as he has expressed it, is practically the type of breathing described by Dr. Laurent. Dr. Miller uses as examples the De Reszkes, Caruso, and Plancon. Holbrook Curtis says the artistic is largely the inferior costal type, combined with expansion and fixation of the upper chest, and he quotes Jean De Reszke, Plancon, Melba, Eames, Nordica, and Patti.

So I repeat, there is an almost overwhelming consensus of opinion from physiologists, and great artists and teachers, that the artistic type of breathing, which is a combination of the distinct types. abdominal,



FIG. 14.—Hyoid bone and laryngeal cartilages. *G*, body of the hyoid bone; *H*, large cornu; *J*, small cornu; *A*, epiglottis; *B*, thyroid cartilage; *C*, arytenoid cartilage; *D*, cricoid cartilage; *E*, upper cornu, and *F*, lower cornu, of the thyroid cartilage. (Ellis, Seiler.)

FIG. VIII.

diaphragmatic, costal,—fulfills the requirements of the singer and speaker, and should be used by the teacher according to the individual needs of the pupil, until the respiratory act has become entirely automatic, and is practiced without thought, as a means to an end. In the case of the pupil, developing exercises may be necessary; in an-

other, simply a more perfect and fuller adjustment of natural conditions.

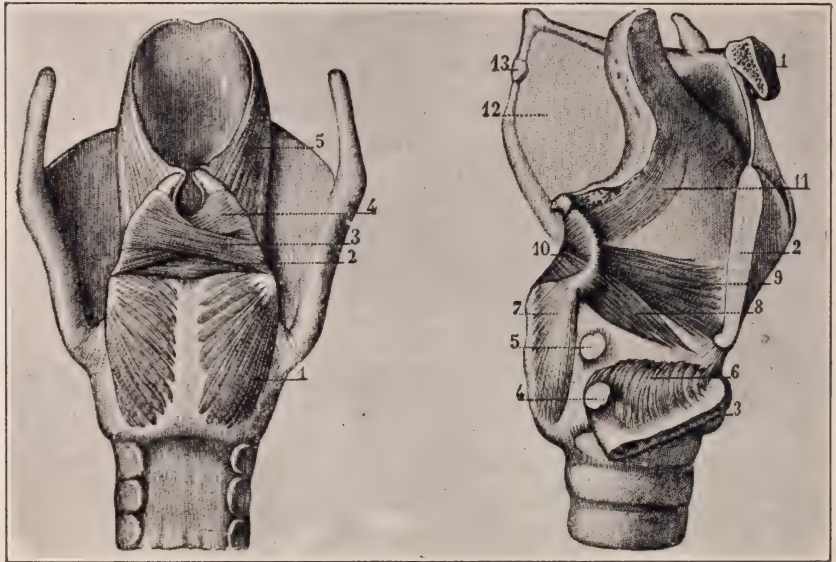


FIG. 16.—Posterior view of the larynx. (From Ranney, after Sappey.) 1, posterior crico-arytenoid muscle; 2, 3, 4, different fasciculi of the arytenoid muscle; 5, aryteno-epiglottidean muscle.

FIG. 17.—Lateral view of the larynx. (From Ranney, after Sappey.) 1, body of the hyoid bone; 2, vertical section of the thyroid cartilage, 3, horizontal section of the thyroid cartilage turned downward to show the deep attachment of the crico-thyroid muscle; 4, facet of articulation of the small cornu of the thyroid cartilage with the cricoid cartilage; 5, facet on the cricoid cartilage; 6, superior attachment of the crico-thyroid muscle; 7, posterior crico-arytenoid muscle; 8, 10, arytenoid muscle; 9, thyro-arytenoid muscle; 11, aryteno-epiglottidean muscle; 12, middle thyro-hyoid ligament; 13, lateral thyro-hyoid ligament.

FIG. IX.

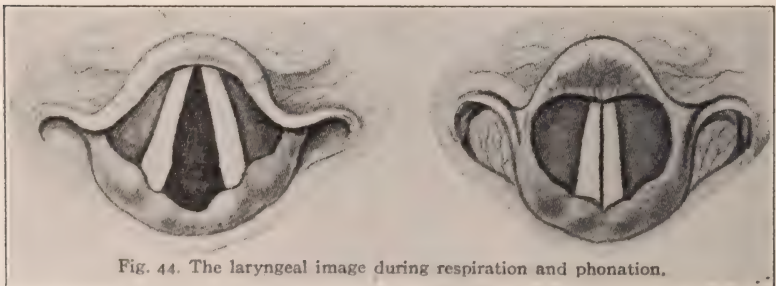


FIG. X.

Once the initial tone is produced by the impingement of properly expired and controlled air against the edges of the vocal bands the amplification of the tone is made by the resonance cavities, shown in

Figs. I, IV, V, VI. The cavities are of different sizes and shapes in every individual, and some of them are capable of considerable modification in size and shape. For instance, the epiglottis modifies the air column, the soft palate determines the amount of air which shall pass into the post-nasal space, the fauces, together with the lips, cheeks, and tongue, determine the size and shape of the oral cavity, and the chest can be made more or less resonant by the elevation or depression of the upper chest wall. The successful demonstration of these physiological acts must depend upon the health of the individual and upon the fact that there are no pathological or natural hindrances to normal speech development.



FIG. XI.—(Shirley).

One of the most common of these is a defective understanding of what a pure tone is. This defect must of course be overcome by cultivation of the ear. Some of the other natural obstacles are a stiff, large, unwieldy tongue, a very small naso-pharyngeal space, or small undeveloped sinuses.

The pathological hindrances are, in children, enlarged tonsils and adenoids, as shown in Figs. XI, XII, XIII; in adults, enlarged turbinated bodies, deflection of the septum, intra-nasal growths, and disease of the sinuses. Tonsils which interfere with the action of the fauces and soft palate are frequently a source of trouble: Relaxa-

tion of the soft palate, and an enlarged uvula; disease of the follicles of the posterior pharyngeal wall; enlargement of the lingual tonsil, with consequent interference with the action of the epiglottis; frequent colds, lapsing into chronic catarrhal states in the larynx and other structures (see Figs. XIV, XV); loss of muscular tone of the larynx, or paralysis of the muscles; relaxation and sluggishness of the mucous membrane lining the resonance cavities. The correction of these conditions is of course of the utmost importance.

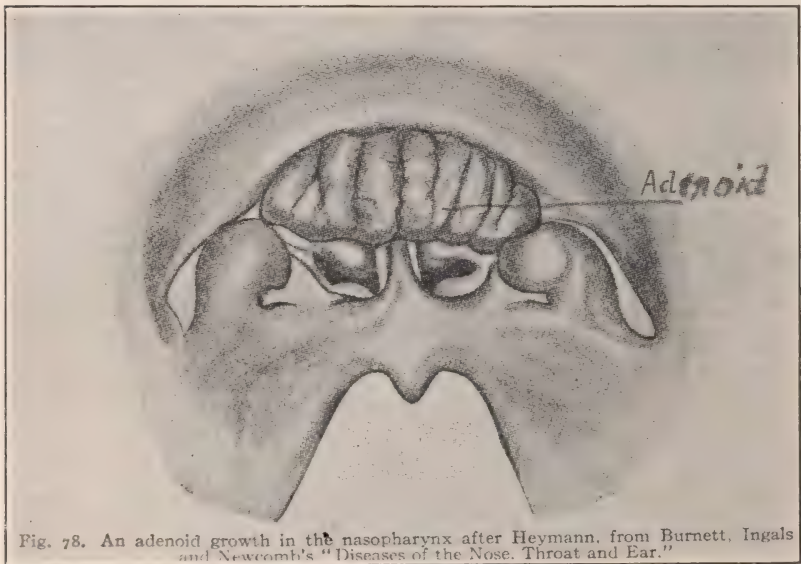


FIG. XII.

The advisability of the removal of the tonsils as a corrective measure in adults is still a disputed point. It is not in the province of this paper to discuss this question at any length. The author is conversant with the literature on the subject, and he is convinced that when the tonsil is a focus of infection, or when it mechanically interferes with the action of the faucial pillars, or soft palate, its skillful removal will prove of benefit to the general health, and to the voice. It is the author's opinion that teachers in our public and private schools should in all cases have a working knowledge of the anatomy and physiology of the vocal apparatus, as well as a cultivated ear, capable of detecting by the sound of a pupil's voice some of the common natural or pathological conditions which may give to the

voice a harsh, nasal, or characterless tone. The voice of the child with adenoids, for instance, is often dull and lifeless, having no carrying power. The voice of the partially deaf child is monotonous and weak in quality. The voice of the pupil with very large tonsils is dead and colorless. A stiff and unwieldy tongue will produce the

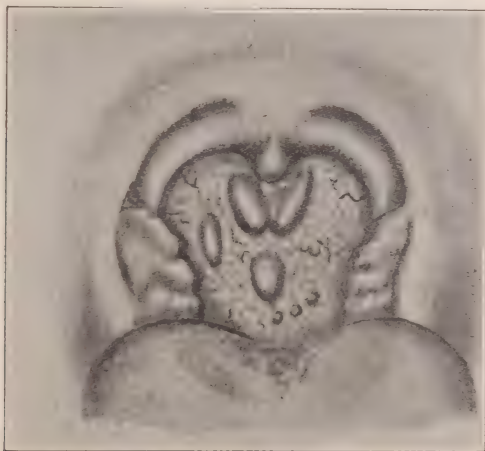


FIG. 130.—Large follicle on pharyngeal wall. Dilated vessels with enlarged and adherent tonsils.

FIG. XIII.

thick, throaty voice, while the hoarse and easily fatigued voice of the sufferer with chronic laryngitis is easily recognized. These are but a few examples of the many variations from the normal which can easily be recognized and corrected.

Again the writer would emphasize the necessity of a good sys-

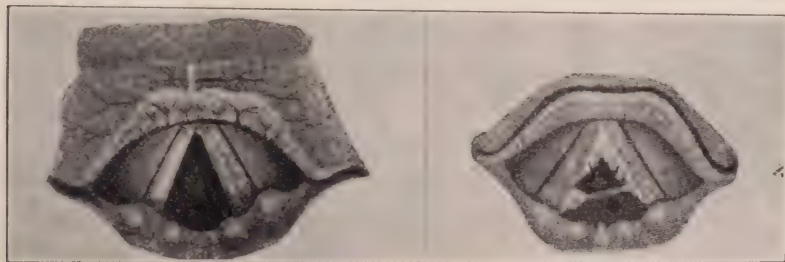


FIG. 14.—Chronic catarrhal laryngitis. Affecting principally the vocal cord on the left side (Burrow).

FIG. 15.—Chronic catarrhal laryngitis, with thickened mucus adhering to the vocal cords (Burrow).

FIG. XIV.

FIG. XV.

tem of respiration, regularly practiced, as of first importance for anyone wishing to retain good health, who desires to be able to use the voice in speaking or singing easily and pleasantly, and without undue effort.

220 Clarendon St.

VOICE HYGIENE.

JOSEPH C. BECK, M. D.,

Chicago.

THERE are four fundamentals underlying proper voice production, and perfect action in each and perfect co-ordination between them are absolutely necessary.

These are:

1. A normal larynx with all its adnexa—nerves, muscles, and blood supply—and normal condition of the structures in its vicinity.
2. A normal mind, insuring normality of the mental processes that are at work when one is using the voice; in connection with this one must have perfect hearing.
3. A normal apparatus for furnishing the power, the air blast: by this is meant the lungs and all their adnexa, such as the chest-wall, muscles, etc.
4. Normal condition of the resonators. This includes the perfect construction of the oral cavity, with palate, cheeks, tongue, teeth, and lips, of the nose and of the hollow spaces within the face and cranial bones known as the nasal accessory sinuses.

When we speak of a voice as pleasant or disagreeable these terms are relative. Up to the present time there is no standard that one may follow. One must differentiate between the singing and the speaking voice in establishing a standard of a voice to go by. Moreover, it is impossible for every one to obtain the perfection of a Patti, Farrar, Scotti, Schuman-Heink, Jean de Reszke, or Alvarez in the singing voice, or of a Blaine, Bourke Cockran, or Beecher in the speaking voice, just as it is impossible for all violins to have the tone, for instance, of a Stradivarius. It is the opinion of many, however, that we shall soon have a phonograph that will reproduce the human voice perfectly. Once we have such an instrument we can obtain some of the most agreeable singing and speaking voices and try to mimic them as nearly as possible. Then we can make records of our own voices and listen to them. It is a well known fact that we do not know how our own voices sound. When they are reproduced, for instance, in a dictagraph

as a rule we are disappointed. I may cite an example of the point in question. A young woman consulted me on account of her inability to make herself understood, having a speech defect which is known as *Rhinolalia pata*, which means a vacant nasal tone. This is due to the non-shutting off of the oral cavity from the nasal. In this case it was due to an inactive soft palate probably following diphtheritic paralysis in childhood. When I asked her if she knew how her speech sounded she stated that she believed she spoke like any other normal-speaking person. Having in mind to correct her speech defect by a surgical measure, which by the way I am glad to say I did accomplish, I proposed to have a record made of her voice on a phonographic plate before operating. I had her say the Declaration of Independence and then listen to its reproduction. After she listened for a short while she had a complete collapse, and she was very nervous for about two months from this mental shock. It was the first time that she had really heard herself talk. I then listened to the record myself and it sounded much better than her actual voice really was.

This perfected phonograph mentioned before is in construction now under the supervision of Dr. Floyd S. Muckey, who has done a great deal in standardization of voices. I cannot allow this opportunity to go by without calling attention to the harm that I have observed to many individuals from what is known as "Special Method Teachers." Many of these teachers have no conception of the fundamentals that I have mentioned early in this paper and promise to make singers of individuals who have neither the proper body or mind to become singers. These people whose confidence is misplaced become very frequently nervous patients and when they finally realize that they cannot make good become very unhappy.

Now as to the care of the voice.

1. Like any other part of the body the speaking apparatus must have sufficient rest. There is a certain degree of ease or relaxation advisable during speaking and singing that insures rest. Therefore the ability of modulation is essential to the preservation of good voices.

2. Exercise is equally important because the lack of activity will leave the muscles of the larynx in a weakened state.

3. There must be ventilation and proper aeration, which

means normal nasal respiration. Mouth breathers have imperfect voices. The locality, it should be noted, in which one sings or speaks must have plenty of fresh pure air of proper temperature and barometric quality. It must not be too moist or too dry, too warm or too cold.

4. There must be perfect physical health, particularly of the digestive tract. Over-eating or under-feeding and constipation are very frequently encountered in vocal breakdowns. Mental worries of any sort will influence voices very much. The Bohemian and Latin races who are of a light-hearted temperament have also great voices, but the melancholy Dane, sober Englishman and neurasthenic American are not so fortunate.

5. It is said that a certain language is more beautiful than another, *e. g.*, the French, Spanish or Italian, and the cause perhaps is that these languages are spoken in musical intonations. For the same reason they are also made more use of in operas than the English or German.

Suggestions have recently been made by educators in this country of developing proper English speech in the school, beginning this careful work in the elementary classes and carrying it on in the high school work, as well as in the university. I should like to add that education should be carried into the home and the child should be taught proper speech from the beginning. Is it not too bad that so many American children are talked to in the silliest babbling baby speech, often until maturity, and in some cases through the entire life? Another thing, by the way, that should be discouraged is the wide use of meaningless slang.

In regard to the many diseases and malformations of the speaking apparatus and its adnexa, I wish to say that each case is an individual one and must be treated as such. I will however enumerate some of the main pathological conditions that influence the voice very markedly.

1. Nasal accessory sinus diseases. When these sinuses are chronically affected their bony structure as well as the mucous membrane lining frequently becomes thickened, and the cavities become smaller and less resonant, especially when pus and polypi form within them. These conditions are usually only to be corrected by surgery.

2. Deviations of the septum and hypertrophies of the turbinated

bodies. Both these conditions cause nasal obstruction, *per se*, and considerable difficulty in tone-formation. These same nasal obstructions tend to cause disease of the nasal accessory sinus as well as interference with proper aeration of the larynx and the rest of the respiratory tract, to say nothing of their influence on the general health. These too are also best corrected surgically.

3. Tonsil and adenoid disease. These structures when chronically inflamed or enlarged, influence the palatal muscles as well as the general systemic condition. Adenoids when enlarged frequently produce a sort of a dead tone in speech or song. As a result of their presence one frequently observes mouth-breathing, which influences the kind of air we inspire, thus irritating the larynx and the remainder of the lower respiratory tract. Surgical interference is the only rational treatment.

4. Malocclusion, missing or diseased teeth, including deformed palates. Speaking is markedly influenced by the proper occlusion of the upper and lower jaws, and through malocclusion there is created a space between the incisors which causes lisping when an attempt is made to fill up this gap by the lip or the tongue. This finally becomes a habit so that even when the dental specialist—the orthodontist—has corrected the defect the lisping still continues, to be cured only by careful education and training. Speech is affected also by missing teeth but this is more easily remedied.

Diseased teeth affect the voice only in so far as they are causative factors in inflammation of the throat and general systemic troubles. The best dentist is none too good to remedy this condition. Cleft palate or perforations of the palate or paralysis of the palatal muscles do have a pronounced influence on the voice, so much so that it may not be understandable. Surgical measures give the best results in the case of cleft palate and palatal perforations, but certain specially made plates known as Prothesis will often produce a remarkable improvement in the speech. In the case of palatal paralysis electricity and exercises will give the most benefit.

5. Diseases of the cheeks, tongue and lips. The tongue-tie was formerly thought to be a cause of speech defect, such as lisping, stammering or stuttering, but this is now discredited. Tongue-tie was considered a shortening of the frænum of the tongue. Any diseased condition of the tongue itself can affect the speech and appropriate

treatment of such a condition will be necessary. The cheeks and lips are often at fault in speaking or singing in that the muscles are insufficiently developed or trained. By proper action and passive exercise much will be accomplished.

6. Singers' nodes and other new growths of the vocal cords and inflammations. Probably the most frequent trouble with a singer or speaker is the formation of the little excrescences on the edges of the vocal cords, producing a hoarse voice. These little nodules are usually in pairs, one opposite the other. These are usually due to the faulty use of the voice in straining, etc.; in other words, ignoring some of the fundamentals mentioned earlier in this paper. After complete rest to the voice, followed by proper exercise of it, they usually disappear. At times they must be removed, when they are large or resist the simple treatment just suggested. Other growths need to be removed by an operation which represents the highest skill of a specialist in throat work. Inflammation of the vocal cords are usually a result of trouble in the nose or pharynx, or of improper use of the voice, and when these are corrected the laryngeal trouble disappears and the voice becomes clear.

It will be seen that proper use of the voice will not only prevent many of these diseased conditions but will even cure pathological conditions, even when established.

In conclusion I wish to say that it is very desirable that commercial houses should pay more attention to the question of correct speech by giving preference to employes who cultivate a good speaking voice, as it is bound to prove beneficial to both employer and employe.

2551 No. Clark St.

THE RELATION OF MOUTH FORMATION TO VOICE AND SPEECH.

FREDERICK BOGUE NOYES, D. D. S.,

Chicago.

WE have been accustomed to think of the features of the face and the tone of the voice as characteristics of the individual for which he was in no way responsible, over which neither he nor his parents had any control. The burden of all responsibility has been thrown upon heredity, as has been done with individual temperament and character. We often speak of a person's inheriting the receding chin of his father's family, or the massive protruding lower jaw, or the prominent, wolf-like eye-teeth, or the thin and nasal tone of voice; or, for that matter, the quick temper or the sunny disposition. Heredity has thus been made responsible for what the individual becomes.

As a matter of fact, the individual receives from his whole line of ancestry a bundle of hereditary possibilities from which the ones that develop depend upon the circumstances of his environment or his individual choice. In both physical and mental growth there is constant action and reaction of many forces, and typical normal development depends upon a harmonious and balanced activity.

In the last twenty-five years we have come to recognize the fact that the occlusal relation of the teeth constitutes a mechanical apparatus through which all of the complicated effects of functional activity are distributed in the development of the bones of the face which results in the conformation of the features. Each tooth is made up of a number of inclined planes which slide upon inclined planes of teeth in the opposite jaw. In every functional activity,—breathing, talking, swallowing, masticating food, and especially in all physical exertion which taxes the muscular strength, these inclined planes are brought against each other with force, and the force brings about the development of the bones. Anything which disturbs the relation of the inclined planes of this mechanism, as the wrong position of any single tooth, or the absence of any tooth from the arch, or anything which

disturbs the normal functional activity or greatly reduces its vigor will modify the development of the bones of the face and destroy the balance and harmony of the features. In other words, an accident of environment or personal peculiarity has prevented the working out of the normal hereditary possibilities.

The first permanent molars erupt while all of the temporary teeth are still in place, usually between the ages of five and six. They come into place behind the last baby tooth, and as they first come in contact the points of their cusps are very nearly end to end. Apparently, at this time, a very slight chance may determine whether their inclined planes slide into normal or abnormal relations, and if they become locked abnormally the whole mechanism of development becomes perverted. From the age of six to fourteen or older, while the face is developing from the baby to the adult, the relation of the first permanent molars determines the relation of the two jaws to each other, during the period in which the temporary teeth are being lost and replaced by permanent ones. If the relation of the two jaws to each other is not normal, the relation of the nose, lips, and chin cannot be normal, and the balance and harmony of the features is destroyed. If the upper and lower incisors are in certain abnormal relations, normal breathing is impossible, and the continuance of abnormal breathing narrows the dental arches, constricts the air spaces of the nose, and affects the form of the sinuses of the bone, and consequently affects the quality and tone of the voice. It is evident, therefore, that an accident in the mechanism of occlusion may prevent the working out of the normal hereditary possibilities and modify both the form of the features and the tone of the voice, stamping the individual with characteristics which should not have belonged to him.

In the formation of voice there are three factors: the breath, the vocal cords, and the resonance chambers. The resonance chambers perform the same function as the sounding board of a piano or the cavity of a violin. If it were not for the vibration of the air in the mouth cavity, nose cavity, and sinuses of the bone, the voice could have neither volume nor quality. The size and form of the mouth cavity not only determines the tones to which the air confined in it will vibrate, but also affects the size and form of the other air spaces. The form of the dental arches and the relation of the

THE RELATION OF MOUTH FORMATION.

teeth to the vault of the palate is essential to the production of certain sounds, and if these relationships are abnormal these sounds are impossible or produced with difficulty. The movements of the tongue are important in the production of many sounds, and the position of the tongue in the mouth-cavity determines the form of the space through which the air is forced, and so affects not only the quality of the tone but the direction in which the sound waves are propelled, and, consequently, the carrying power of the voice. A constricted dental arch not only modifies the form of the air spaces but cramps and confines the activity of the tongue, forcing it backwards into the throat, muffling the tone, and injuring the carrying quality of the voice. Much might be written of the ways in which the form of the dental arches and the dental palate affect the character of American speech, but I want to show by one or two concrete examples that the deformity which results from the disturbance of the normal developmental mechanism can be cured or greatly improved, and should be prevented by seeing that the mechanism is working normally during the period of growth, and supplementing its deficiency by mechanical assistance.

The first case is taken from Dr. Angle's "The Treatment of Mal-

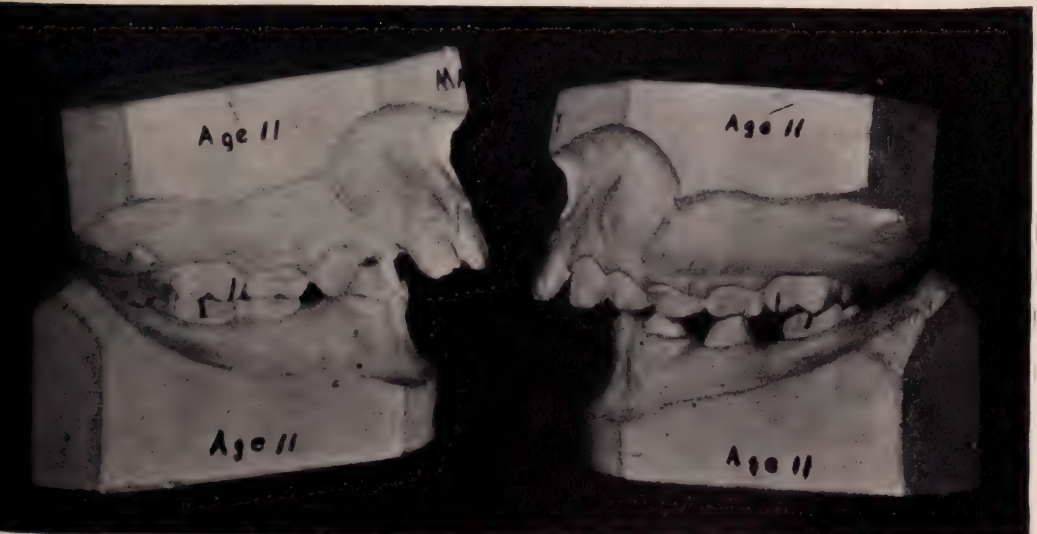


FIG. I.

occlusion of the Teeth." A boy aged eleven whose features have developed with the molars locked in abnormal relation. Figure 1



FIG. II.



FIG. III.

shows the relation of the teeth. The upper incisors are prominent, the lower incisors are elongated to strike against the roof of the mouth. Both arches are narrow, and normal breathing is impossible. If the first molars were in their proper relation the black lines would come over each other; in other words, the mesial anterior cusp of the upper



FIG. IV.

first molar would strike between the cusps of the lower. As it is, the distal, or posterior cusp strikes between the cusps of the lower. Figure 2 shows the front and side views of the face at the time the

THE RELATION OF MOUTH FORMATION.

models were taken. Figure 3 shows the face after treatment. Notice the balance and harmony which has been attained in the features. In the front view, notice the development in the lower third of the face, the increase in the distance from the tip of the nose to the tip of the chin, and the harmonious distribution of the features in the oval of the face. Figure 4 shows the models at this time. Both arches have been widened, increasing the space for the tongue and entirely changing the form of the palate. All of the cusps of the teeth are in their normal relations to each other; the upper and lower incisors meet each other properly, and it is possible to have a normal voice of good quality, which would have been impossible if the conditions had not been corrected.

Figure 5 shows the models of a young man of twenty-two, whose



FIG. V.

face is shown in Figure 6. These conditions were caused, at least largely, by the early decay and final loss of the upper first molars, which has resulted in the protruding and over-development of the lower jaw and the depressed expression around the base of the nose. It will be noticed by the relation of the black lines that the second molars are in approximately normal relation, but that the upper arch has collapsed and that there should be a first molar between the second molar and the second bicuspid. In the treatment of this case, the bone was made to develop until the space for that first molar was restored. Figure 7 shows the space partially restored and a great improvement

in the relation of the teeth. Figure 8 shows the final models, and Figure 9 the face at the time the final models were taken. Figure 10

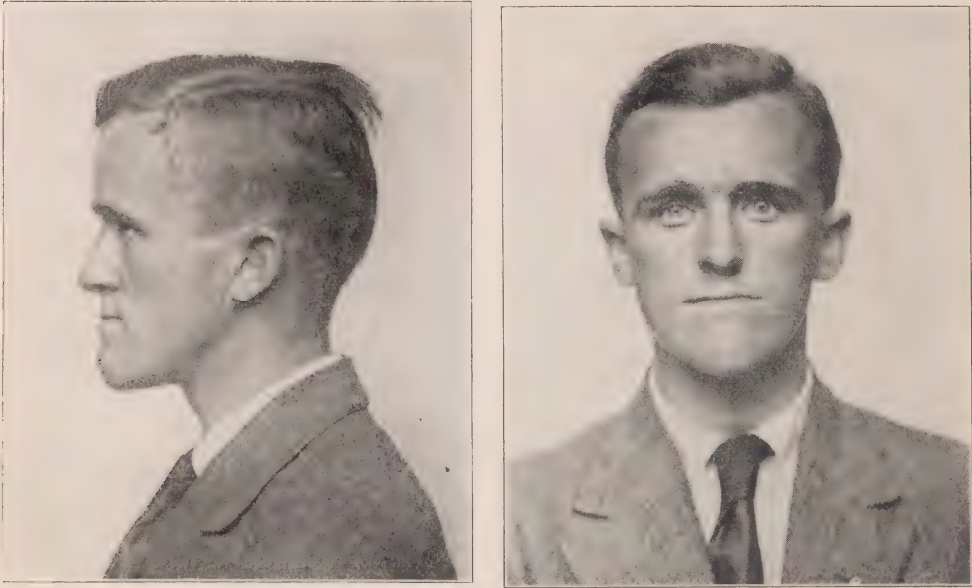


FIG. VI.

shows the form of the palate at the beginning and the end of the operation. The change in the volume and the quality of this man's voice was very marked.



FIG. VII.

THE RELATION OF MOUTH FORMATION.

The chief aim of the orthodontist is to so supervise and supplement the process of dentition that the individual may have the normally proportioned features which his heredity made possible, and the

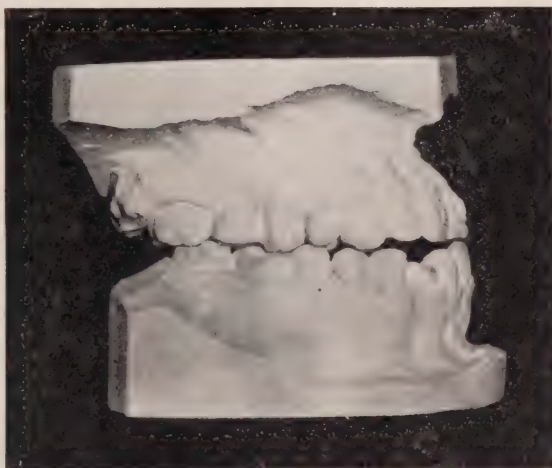


FIG. VIII.



FIG. IX.

possibility of a voice of normal and pleasing quality. Certainly these are inalienable rights with which no accident of development should be allowed to interfere, and it is theoretically possible by attention to

the mechanism of occlusion to improve the proportion of the features
and the tone of the voice in the rising generation of Americans.

122 South Michigan Ave.

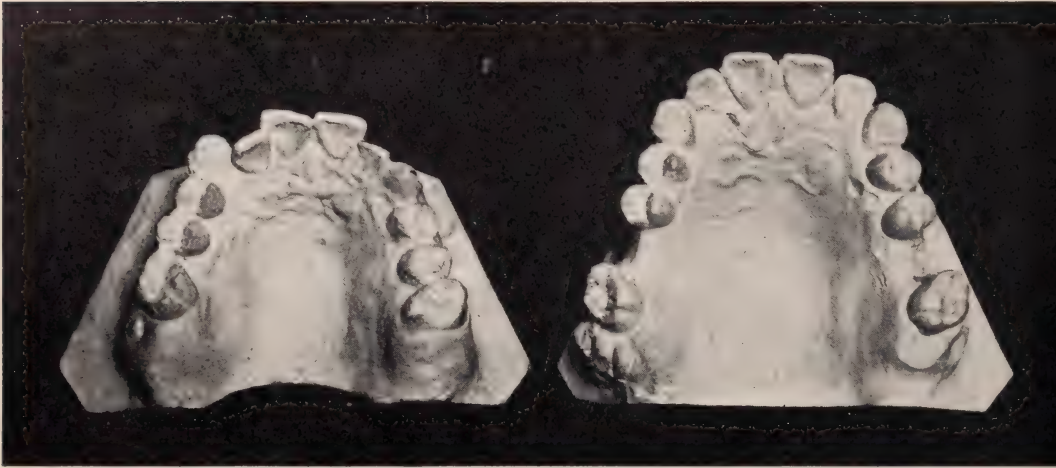


FIG. X.

SPEECH DEFECTS IN CHILDREN.

SMILEY BLANTON, M. D.,

Madison, Wisconsin.

SPEECH defects among children have been neglected by both physicians and educators in America, with a few notable exceptions. Dr. G. Hudson Makuen, of Philadelphia, has worked in this field for many years, and the careful work of Dr. Scripture, especially in corrective phonetics, is too well known to need comment. Dr. John Reigert, also, principal of one of the New York schools, must be mentioned as one of the first American educators to give his attention to this neglected field. Even the education of physicians towards speech defects has been so neglected that often they advise against any treatment and the parents of children who stutter are assured that the trouble will be outgrown. As a result of this lack of knowledge on the part of the physician, sufferers from this defect have flocked to the stammering schools and the non-medical "Speech Specialists" who in most cases are quacks of the worst kind, guaranteeing cures which they know they cannot always obtain. Dr. C. S. Bluemel, who was himself a stutterer and who has taken treatment at many of the stammering schools in this country and abroad, in his book "Stammering and Cognate Speech Defects" has this to say of these schools:

"Many of them (the systems used at the schools) are entirely devoid of merit; they have been recorded merely because they are the gold bricks that are daily sold to stammerers by an infamous fraternity of 'speech specialists.' * * * Progress is hampered by the charlatans who rob the stammerer and bring everybody and everything connected with the treatment or investigation of stammering into disrepute.

"The writer has never known of a worthless institution that was not recommended by a body of bishops, colonels, mayors, postmasters, doctors, and men that are usually credited with intelligence."

Dr. W. A. Evans, of the *Chicago Tribune*, says: "'The great secret' guarded by speech specialists is the fact that the stammerer is being bunkoed."

The extent of speech defects among school children during the

last decade is shown by statistics gathered by several observers. In 1904 Conradi made a survey of 87,440 children in the following cities: Milwaukee, Cleveland, Louisville, Albany, and Springfield, Mass. "Of these two and forty-six hundredths per cent. had speech defects, eighty-seven hundredths of one per cent. stuttered, and one and fifty-nine hundredths of one per cent. had other defects of speech." A few months ago Dr. Wallin, of the Psycho-Educational Clinic of St-Louis, took a census of 89,057 children in the schools of that city and found that two and eight-tenths per cent. had well marked speech defects. Of lispsers there were 1,448 or one and six-tenths per cent., and of stutterers 683 or seven-tenths of one per cent.; four-tenths of one per cent. had some other form of speech defect. In all there were 2,536 cases of speech defects reported. These figures were obtained by questionnaire. In order to check up this method I am making a personal survey of about five thousand children in Wisconsin, as well as by the questionnaire, to see what difference the two methods give. The report will not be complete until later, but at the present time I have tested some two thousand children and found over five per cent. with definite speech defects; of these slightly over one per cent. are stutterers.

Speech defects may be divided into two classes, according to their cause. First those due to organic causes; and second those due to mental causes, which are sometimes called functional speech defects.

Lisping is one of the chief organic defects, caused in most cases by an imperfect occlusion of the teeth. If there is a marked protrusion of the lower jaw so that the lower teeth come in front of the upper when the jaws are closed, lisping or imperfect speech is sure to result. And the same is likely to be true if the upper teeth protrude too far in front of the lower. These deformities of the teeth and jaw are often caused by thumb-sucking and the use of the "pacifier." A very high palate arch such as often occurs in adenoids may cause lisping, and indistinct speech. These deformities seem to prevent the tongue from moving about easily, especially from rising in the roof of the mouth to make the *s* sound, and so the sounds made by the tongue lower in the mouth are substituted.

Thick and indistinct speech describes rather poorly a type of defect that is often caused by an imperfectly developed tongue due to rickets or some abnormality of the internal secretions. Malforma-

tions of larynx may cause indistinctness of speech. Often, however, the defect is caused by a deficiency in the development of the nervous system. The developing child does not have the skill to make easily and correctly the fine co-ordinations necessary to distinct speech. This defect is the one found most frequently in the backward and feeble-minded. But there are some cases where there is normal intelligence but there is lacking the ability to co-ordinate the speech mechanism. I have in mind the case of a little boy of six years, who has normal intelligence, but who lacks this co-ordination; he cannot run or march well, and falls down frequently, can scarcely draw such simple things as a square, and his speech is very unintelligible. The defect is only a phase of poor muscular co-ordination. Such cases are greatly helped by proper training. Nasality caused by cleft palate, paralyses or weakness of the soft palate, or enlargement of the adenoids, is one of the organic defects.

Stuttering is the most important of the functional speech disorders. There are some specialists, especially abroad, as Gutzmann, that believe stuttering is due to some physical cause, but most observers in this country follow Scripture in calling it a functional disease. I believe that most cases of stuttering are caused by some mental conflict. Some of these may be conflicts such as the Freudians believe to be at the bases of all psychoneuroses. Some may be such as Dr. Scripture and Mrs. Scripture describe in Hebrew children, who have a language conflict because they use Yiddish at home and have to use English in the school. Weakness of the "speech center" and momentary auditory aphasia are among the things that have been given as the causes for stuttering. Whatever the cause, it is certain that consideration must be given to the child's mental condition before most of the cases can be cured. Under functional speech defects is to be included hysterical aphasia. This is seen occasionally in children who have received some shock. Often it is caused by some slight accident that greatly frightens but does not injure the child. After the accident the child loses the capacity of speech, and it is sometimes weeks before it is restored.

There are many other types of speech defects that occur in the various nervous diseases, as in general paralysis, pseudo-bulbar paralysis, paralysis of the tongue or vocal cords, but these defects are practically never found in the schools, and when they occur they are

merely parts of a more serious disease, so I have not included a discussion of them in this brief paper.

One of the serious aspects of speech defect is its relation to backwarkness. There are some cases in whom the speech defect is only a symptom of the mental deficiency. In these the defect is usually that of indistinct or thick speech. Stuttering is seen rarely in children who are below normal mentality. In fact stutterers are usually of superior intelligence. This being the case it is all the more noticeable that so many of them are backward in their classes. Often we receive the report from the teacher that the child is backward because of the speech defect. It is not hard to see why this is. Inability to recite properly, poor reading and poor work in language subjects would naturally prevent normal progress in school.

Even more serious than this is the relation of stuttering and other severe speech defects to delinquency. Dr. William Healy of the Juvenile Psychopathic Institute, Chicago, who has studied thousands of delinquent children says: "We have been tremendously impressed with the influence which a speech defect has upon the personality of the offender. We entirely agree with several authorities who state that the tendency of stuttering is to make the individual highly anti-social. The victim of this annoying disorder looks upon himself as very different from others of his kind, and is easily won by suggestions of anti-social behavior. * * * Thieving, vagrancy, and homosexual practices have in consequence been indulged in.

"Character deterioration has been made much of by specialists in speech defects. These maintain that the emotional disturbance and discouragements lead all the way to definite psychoses and marked suicidal tendency. From our own vivid experiences, as well as the emphasis placed on the subject by others, we are convinced that a stuttering offender needs above anything encouragement and special treatment."

From the investigations of various men in this field we are justified in saying that from two to five per cent. of children are suffering from a definite speech defect, and about one per cent. of these are stutterers. In the whole country there are well over two hundred thousand children who stutter, and the total number with all defects will come close to a million. But there are many children with poor voices, mumbling, unintelligent speech whose deficiency is not severe

enough to be called a definite speech defect. These children, too, need treatment. It is quite true that many children who have some definite speech defect get over it without treatment, but in most cases they retain some trace in their speech of slovenly and poor articulation. Dr. D. J. McDonald writing of New York City says: "A study of speech conditions in our public schools shows that two hundred thousand of the eight hundred thousand children are afflicted with stuttering, mumbling, lisping or foreign accent."

Vigorous steps must be taken if this tremendous problem of speech defects and poor speech in our school children is to be met. It needs the co-operation of college professors, psychologists, teachers and principals in primary and secondary schools, physicians, and the members of the school boards who must be persuaded to vote money for special teachers to work in the schools. For it is in the public schools that the problem must be solved. The child enters school with its speech yet imperfect, while some of them have defects that if not remedied will develop into more serious defects. Not until the age of seven is the child able to make correctly all the sounds of the language and not until the age of puberty has he thoroughly mastered his speech mechanism, and any shock or nervous upset before this time may easily disorganize the speech mechanism and cause stuttering. I believe that if the child during the early school years were given some training in normal and corrective phonetics, and a few simple exercises in voice training, that is, exercises for the development of a good tone, change of pitch and inflection, a great many of the speech defects could be avoided altogether, and the average child's speech could be greatly improved.

One of the forward steps in the matter of improvement of speech has been taken by New York City as announced in the *New York Times* of November 28th last. A special speech department has been organized with a medical specialist at its head. The ordinary school physician has too many other duties and lacks the special training to oversee this work. "Every child with a speech defect will be studied, diagnosed and prescribed for. If the handicap is caused by some pathological condition of the speech organs or by some simple thing like adenoids, for example, the cure will be easy. If the cause is more deeply seated the specialist will be able to deal with it. Each child will be dealt with separately. These children will receive special work,

exercises, etc., for a certain period every day during school hours, under the care of a teacher who has received proper training, and who is under the direction of the specialist in the Department. Another function of the Department is the standardization of the speech of the children.

"Graded phonetic drills, embracing all the fundamental sounds of the language, will be instituted in the public school curriculum, so that daily exercises can be given every child in order to obtain perfect enunciation and correct careless speech or foreign accent."

I look forward to the time when every state Department of Education and every large city will have a Speech Department with enough special teachers to adequately meet the situation. At first it is well to lay stress on the children with severe handicapping speech defects, for these cases make the greatest impressions on the school boards who have to appropriate the money, but later the special teachers working in co-operation with the primary grade teachers can arrange exercises that can be given to every child.

This is a medico-educational problem. On the one side speech defects shade off into the field of nervous and mental diseases. The feeble-minded, the organic and hysteric aphasias, the stutterers, etc., come clearly into the field of the physician. Also there is the problem of enlarged adenoids, diseased tonsils, and bad teeth that require medical and dental care. On the other side speech defects shade off into the field of poor, unintelligent, slovenly speech. It is the function of the physician to see that the child has the proper organic and mental conditions for speech, and it is the function of the special teacher to train the child to use its speech mechanism in an easy, correct, and pleasant manner.

It is very necessary that the special teacher be properly trained. She should have a thorough training in normal and corrective phonetics, the anatomy and physiology of the vocal mechanism, and some knowledge of normal and abnormal psychology. The best results are obtained, as Dr. Makuen points out, when the physician and the special teacher work together.

It is hoped that there will be a nation-wide movement to arouse the interest of the public to do something for children with poor speech or definite speech defects. The problem must be solved in the primary grades while the child's speech is still in the formative stage. The goal

SPEECH DEFECTS IN CHILDREN.

at which we aim should be to prevent poor speech and speech defects, and not to wait until they have become fixed in the life of the individual.

University of Wisconsin.

THE VOICE IN SINGING AND IN SPEECH.

SHIRLEY M. K. GANDELL, M. A.,

Chicago.

IT has been held by a certain school of teachers of singing that the action of the voice in singing is quite different from its action in speaking. Yet the construction of the vocal organs does not seem to bear out this theory. It is true that the possessor of a beautiful singing voice may speak badly, and an individual whose speech is mellow and attractive may sing in a way devoid of charm. But all that is proved by such occurrence is that the same voice can produce many different kinds of sound. The problem for teachers of singing and speech alike is to select the qualities of sound consistent with the utmost freedom of the vocal apparatus. Now an agreeable speaking or singing voice does not in the least imply this freedom, as I learnt in the course of my work with Dr. Floyd S. Muckey, whom I had the good fortune to meet rather more than three and a half years ago.

In order to make this statement more easily intelligible it is advisable to indicate briefly the physical facts connected with sound, and to consider the special equipment of the vocal apparatus. Waves of vibrations of the air, moving at the rate of some eleven hundred feet per second, constitute what we know as sound. When the waves are regular we hear a note of definite pitch; when they are irregular we hear what may be roughly described as a noise. The rate of vibration determines the pitch. If the waves are set in motion in the open air they spread in all directions, and speedily become inaudible unless of great size. But if they are propagated in close proximity to a hollow chamber of suitable dimensions, and having one or more openings, the air inside this chamber will be set in vibration at the same rate. As these vibrations can only escape into the open air through the apertures of the chamber their power is correspondingly intensified, producing the effect known as resonance. Resonance multiplies the power of the original air-waves several hundred times. The two essential factors of a musical instrument are a vibrator capable of initiating waves of various rates and dimensions and a resonator capable of reinforcing them

adequately. In the voice the vocal cords are the vibrator, and the cavities of the mouth, throat and nose are the resonator.

Now a musical tone is not as a rule simple but complex, consisting of a fundamental tone and overtones. These overtones vary in different instruments, and it has been demonstrated that the overtones of the voice are the same as those of stringed instruments. The fundamental tone should be proportionately the strongest if the sound is to be mellow and full, and to reinforce it adequately a large resonance space is needed. If, owing to interference by the soft palate, the air waves are denied free access to the post-nasal space, the size of the resonator is much diminished; soft palate interference also cuts off the four upper overtones which are necessary to give the tone its full beauty. This fact has been established by the researches of the late Professor William Hallock, of Columbia University, and Dr. Muckey. The latter has also brought into its proper prominence the fact that the pitch-making mechanism, the vocal cords, is actuated by involuntary muscles, whereas the resonator and the articulating processes are controlled by voluntary muscles. The latter, being set into activity by the will, can and do interfere seriously with the free action of the involuntary muscles. When the latter function in freedom they produce a wide range of tones with a minimum of effort. The problem of tone-formation thus reduces itself to the development of these involuntary muscles and the securing of their unhampered activity in conjunction with the full use of the entire resonator.

Dr. Muckey has devised exercises for this purpose with which I have experimented both upon myself and my pupils, and I am convinced that their proper use does very much for voice development. Disagreeable qualities in both singing and speaking can be eliminated by their aid with certainty, though the process is hardly ever a rapid one, demanding perseverance and faith of no ordinary kind. Age must be taken into account, also, as well as the preceding qualities, since a habit of long standing is harder to eradicate than one of recent date.

It was said above that agreeable qualities in a speaking voice do not necessarily imply a total freedom from interference; as a matter of fact they only imply an absence of the particular kind of interference which produces a disagreeable quality of tone. Since an agreeable tone-quality is not a sufficiently high ideal for a reformed speech, for if American speech is to be reformed it may as well be

done thoroughly, it becomes pertinent to inquire what the ideal should be. Speaking as a singing teacher who is equally interested in the speaking voice I should say that the ideal voice should combine clearness with mellowness and power. It is very rare to find these three qualities united in American speech. Power and clearness are often present, but mellowness is hardly ever joined to them. Not infrequently the quality is pleasant but resonance and power are conspicuous by their absence. Yet it may be taken for granted that any normal vocal organ is capable of producing a wide range of sounds in which the three desirable qualities above-mentioned shall be displayed. But the owner of the vocal organ must first learn to listen to the sounds that it is in the habit of making, and to hear them as they really are. This is the main difficulty in the case of an adult and one that it is hardly possible to over-rate. In the case of children, however, the difficulty would seldom arise, (since beautiful sounds are actually easier to make than un-beautiful ones,) if their environment surrounded them with beautiful sounds spoken or otherwise.

The first thing to be done is to prove to demonstration that the sound of the vowels should be identical in both song and speech so far as the factor of tone-production is concerned. To the best of my knowledge this has not yet been accomplished, but there is reason to believe that it can and will be done. Once this point has been definitely decided, means must be found to provide models of speech, approaching ideal perfection as nearly as may be, for children to hear and imitate. When the phonograph has been perfected this should prove quite feasible. Thereupon a new era of speech would commence and the desire for lovely sound would spread. Once this desire has become dominant, vocal ugliness would be shunned as much as any other disagreeable habit. There would be fewer colds and throat ailments of all kinds. The special singing voice would develop naturally, no longer handicapped by erroneous notions about the real relation of volume to effort, and forcing would cease. Teachers of singing would no longer be divided as they are at present upon questions of method and breathing, and perfect diction would be found as easy in English as in other idioms. Language spoken or sung would enter upon its natural inheritance, and the community at large would acquire a realizing sense of the deep verity underlying the words of Keats, "Beauty is truth, truth beauty."

Cosmopolitan School of Music.

SPEECH AND THE COMMUNITY.

FRED NEWTON SCOTT, PH. D.,

Ann Arbor, Mich.

THE question how American speech can be improved is in part an individual question, in part a social question. The two aspects are of equal importance, but in this brief note I will confine myself to the second. It is perhaps the aspect that is most likely to be neglected in practice.

The speech of each one of us is moulded by the community in which he lives. We speak not as we like, but as our environment compels us to speak. Long before we are able to take thought for ourselves, our speech habits are fixed almost beyond control by our parents, our playmates, our neighbors, and our teachers. We may, indeed, acquire a different mode of speech in later life, but it will be acquired with difficulty, it will never seem so much a part of us as the speech of our earliest years, and it will desert us shamelessly in moments of excitement or embarrassment. Twice and thrice fortunate, therefore, is the youth who grows up in a community where simple, idiomatic English, spoken without affection or shrillness, is the rule. One who has bathed in such a medium in the days of his youth is thenceforth immune. Nothing can touch him,—neither slang, nor bombast, nor yet slovenly enunciation. If for a time he drops into bad ways through imitation, the evil influences will not penetrate very far and in the crises of his life they will fall away from him like a loosened outer garment.

It is to be seen, then, that the essential thing is to be born into the right community; and since communities (from the point of view of good speech) into which one may safely be born, are not very numerous, it is the business of those who are interested in such matters to help increase their numbers. Much will be accomplished toward this end if those who care will at all times speak as well as they can. We feel responsible for the good health of the community, for its politics and its economics. Why should we not feel an equal responsibility for its speech, especially when we think of those with speech-habits yet

to form who are newly come into it? It is not too much to say that a point of honor is involved here, and that no citizen can be said to have done his entire duty to his country and to the next generation unless he has contributed his share toward raising the standard of spoken English in his community. Only in this way can that freedom of speech which is guaranteed to us in the National Constitution become a living reality,

University of Michigan.

THE SCHOOL'S FUNCTION IN SPEECH IMPROVEMENT.

JAMES E. McDADE, M. A.,

Chicago.

IN forwarding the movement for improving American voice and speech, it is of the utmost importance that the co-operation of the elementary schools be enlisted. Only a minority of the coming generation are reached by the secondary schools, and still fewer by the higher institutions of learning. Though these wield an influence greatly disproportionate to their numbers, it is deferred, and works its way slowly, while the elementary school is in a position to get immediate results. Besides, improvement in speech is largely a matter of getting new habits adopted, and this can be accomplished most rapidly and permanently in the habit-forming age of the child, when he is plastic and impressionable. Undesirable habits that are deeply ingrained in childhood are later overcome, if at all, only by an undue expenditure of energy. Economy dictates an early start.

Speaking from the standpoint of the elementary school, one may say that conditions are much more satisfactory with reference to crudities of speech form, and even of enunciation, than in matters of tone and modulation. Teachers generally are hostile to errors in grammar and objectionable colloquialisms, even if they do not succeed in eradicating them. More effective methods, based on the pedagogy of habit, are being employed. Teachers are trying to make speech in school more vital by motivating it and bringing it into immediate relations with the child's life and interests, so that as a habit-forming agency it may successfully compete with his interested speech outside of the class-room. The value of good literature within the child's comprehension as a stimulating influence is generally appreciated. The attempt is made to arouse such a pride in correctness of speech as will make the work of the school bear fruit on the street and in the home.

A tabulation of the actual errors which form the great bulk of those to be corrected show that they are not as numerous as one might suppose, and that they fall into groups that may be dealt with as

units. Such definiteness of attack with appropriate drill may well assist in the eradication of the long-standing faults of language, while the child is led through vital, interested speech to ease and flexibility of expression.

Neither is the outlook quite discouraging as to slovenly enunciations, elisions, and mispronunciations. It is not uncommon to find too much, rather than too little stress on this element of speech. Normal schools are giving it attention in the training of teachers, and the schools generally can not fairly be accused of neglect. The greatest difficulty is to secure the unobtrusive balance between slovenliness and elocutionary exaggeration. Many elementary schools are attaining in their reading and speaking a clean-cut articulation that is highly satisfactory.

But tone and modulation in speech offer a much more difficult problem. The causes are deep-seated, and there is not only an insufficient apprehension of the end to be worked for, but in too many quarters an unconsciousness that any such problem exists at all. For these reasons it is precisely with reference to this phase of American speech that the greatest need exists for an educational campaign to characterize the faults clearly, to search out the causes, and to bring about a public sentiment that will be the guarantee of an eventual remedy. The stridency and staccato too common in American speech, the inelasticity in inflection, and similar faults, are perhaps not as superficial as they seem to be. Haziness of phrasing and rambling composition reflect blurred and jumbled thinking. Tone in speech is even more primitive, and faults of tone suggest some deeper tendency of which they are the index. The voices of children register their past habits of expression, and these are only partly accounted for by deficiencies or unfavorable factors in the school environment. Direct imitation of their elders is in some degree responsible, but old and young alike are the victims of prevalent conditions in American life that are fatal to the poise out of which quiet, varied, and pleasant tones naturally proceed.

Life as it is now lived in America, by children as well as by adults, has in it a hurry and rush that finds its appropriate expression in the tones of common speech. Practical matters are insistent on every hand. There is an over-emphasis on action and an impatience of deliberation that beget nervous haste, fussiness, superlatives, and harsh tones. It

is not at all a question of an intensity which it is proposed to repress. Intense life is to be desired, if it is at the same time broad, varied, and above all, balanced.

Of course, we are not here immediately concerned with tendencies of our times. We are aiming at results in the way of practical reform. But conditions in the schools are closely bound up with conditions outside. There is the closest possible relation between the hurry, nerves, and harsh tones of the class-room and the same phenomena in the life about it. All the multifarious problems of congested cities, in one form or another, crowd in as demands upon the teacher.

Let us state the difficulties more concretely from the standpoint of the school, with the object of indicating what seem to be the points of attack. They appear first of all in the increasing demand of the public for practical results in a material sense. Any movement which is largely cultural in its aims must run the gauntlet of those whose primary interest is immediate and practical. Having come through safely and been established, it is not free from the danger of being mechanized in the strenuous competition of the course of study. The crowded class-rooms with their mixture of races complicate the difficulties, and there results a nervous anxiety to "cover the ground" which is apt to be fatal to those things which do not present themselves as just so much ground to be covered.

This is said, not in the way of discouragement, but rather to plead the exceptional need of strong backing for just such movements as these as a means of keeping a proper balance of educational tendencies, and to indicate where energy must be expended if we are to get satisfactory results.

The elementary school feels the pressure from all sides more directly than the secondary or higher schools, and has more distinctly the atmosphere of constraint and hurry. Too often under the pressure there is developed in teacher and pupil an attitude of tension and impatience that manifests itself in forced, nervous tones of speech. The campaign in elementary schools might well begin by preaching the gospel of relaxation, especially for the most crowded class-room. We must try to banish the high-pitched expository tone, and tones ag-grieved, nervous, or unnecessarily loud. These proceed from high tension, either in the school or out of it. We need to let down, and to take the time to do some things leisurely and well, even if we have to

force ourselves to forget for the moment that other things seem to be crying for attention. We can make the most of what opportunities we have for pure abandon, as in music and literature, and refuse to be bullied by ever-present practical considerations into taking everything quantitatively, as so much ground to be covered in so much time at all hazards.

Give the elementary schools a clear appreciation of the ideal to be striven for, and of what it means to the culture of the people they serve, and they will be a most potent influence in helping to realize it. The more clearly it comes to them as a demand from the public, the more immediately will results be obtained. The ways in which the results will be arrived at will be worked out when the need is felt, but some of them are so obvious that they may be briefly referred to.

First of all, there should be careful attention by the teacher to her own speaking voice. Her tones give the atmosphere to the class-room more than any other single factor.

As to the possibility of securing results from intelligent work with the children, there is a most striking example in the remarkable improvement in the quality of tone in singing, an improvement brought about in a few years by teachers in every city in the country. It is significant, too, how intelligently teachers have learned to work for abandon and relaxation as a means of securing easy and beautiful singing tones. If it can be done in singing, it can be done in reading and speaking, but no attempt of the sort has been consistently carried out. It is very common to find a primary teacher demanding and getting admirable tone-quality in a song, and insisting, five minutes later, on a shouting voice in a phonic exercise or a reading lesson. It would not be difficult to transfer the discipline of the singing classes to the language work if the need for it were definitely formulated.

There should be far more reading aloud of good literature by the teacher, and there should be the same attention to voice that there always is in rendering a song for the purpose of training the ear. Reading aloud by the children gives the best of opportunities for developing an easy and pure voice quality, often with emotional coloring, as in singing, and never permitted to become strained or artificial. The increased interest in dramatics, now so closely related to the reading and literature, gives further opportunity and stimulus in the same direction.

THE SCHOOL'S FUNCTION IN SPEECH IMPROVEMENT.

In these days, when the typewriter is supplanting the pen, and the telephone is relieving both, it would not be amiss to shift to voice and speech some of the attention that has so long been the prerogative of written language. Written composition we must have, but better results would follow if oral composition were more largely used as a preparation for it. When easy and fluent speech has been secured, written composition shows improvement at once, but writing does not react in any such favorable way on oral language. Much speaking under the most natural conditions possible, and under the influence of a teacher with a well-defined ideal, is the surest way to speech-habits that can be depended on to be permanent.

The normal schools can do much to place such clear ideals before the young teachers. Those now in the schools should receive similar instruction, and should be enlisted in a wide-spread movement to make well-pitched, quiet tones and pure English the rule in every school-room. It is in this way that the schools can exert their influence, and it will be found to be one of the most effective agencies in raising the standards of American speech.

Fallon High School.

AMERICAN SPEECH AND THE STAGE.

OTIS SKINNER,

Bryn Mawr, Pa.

THERE is no institution of this country where reform is more pressing than the American theatre in the department of its pronounced speech. The stage has a far more subtle influence over our actions than the class-room or the personnel of business institutions. Particularly do we go to the theatre at the impressionable, habit-forming age predisposed to admire what we see and hear. Admiration soon turns to imitation, and imitation to adoption of the speech and manner of the model.

This has been noticeable in the rank and file of my own profession. I recall how prone the members of Henry Irving's company were to take on suggestions of the eccentric delivery of their chief. Lawrence Barrett's company were strongly impregnated with the pedantic elocution of the star, and John McCullough's support were nearly all little McCulloughs.

During the height of the late Ada Rehan's popularity at Daly's Theatre it was always amusing to hear young women both on and off the stage imitating the Rehan drawl.

The stage direction is, of course, a power in this department for good or evil. The ideal director is he who not only sees effective situation and suggestion but whose ear is attuned to the finest shades of harmony and correctness. Much insistence must always be brought to bear on the actor's speech that proclaims its Middle West, Southern, New England or Pennsylvania origin, or its birth in the tough argot of New York City's lower middle class, and much patience and attuning of ears must be exercised for the removal of the impurity. Until extensive missionary work is done in the localities wherein the offending accent is born, the stage will inevitably suffer from the imperfection of utterance that is brought to it. The dramatic art of England and America labors from want of standard, particularly as regards its pronunciation and enunciation. It is not so with the stage in France and Germany. In those countries the spoken language is to be heard

in its perfection from the stages of the leading theatres and foreign students of the native tongues are sent to listen to plays that they may attune their ears to correctness. This is alas! not the condition with us. Slovenliness, while not the rule, is too often to be found and provincialism obtrudes painfully at times. I believe we are bettering the speech of our American actors, however, and we are finding that many of them are not past vocal cure.

There is much that can be accomplished for the purity of stage English in the school and college, aside from the conserving by proper and inspiring models among the instructors, a correctness of speech among those students who later may take up acting for a livelihood. It too often happens that teachers and college professors who have marvelously stored minds are damnable in utterance, but with this problem it is not in my province to deal. What would be of value, however, would be speech classes that would have for part of their work the criticism of the manner of actors in high-class plays current on the stages of the various cities. Faulty stage vocalization, instead of being a menace by becoming a model, would become a horrible example through the detection of its impurity. The young critics could discuss the faults in class with imitations and examples, after an evening at the play.

Like the botany and geology classes that are sent among the plants and rocks the students of the spoken word could find examples among the best and worst of actors and public speakers.

The teachers of such classes should be speech experts and form a part of the faculty of every college in America. This course could be made attractive and popular.

Think of the stimulus to the actor when he knows that a large group of eager young critics are attending his performance to pass upon his enunciation!

The theatre in America has no Paris Conservatoire. There is no national training school. We must take our raw material where we may and, while it is giving supposedly expert service, mould it into efficiency. It becomes our daily prayer that some leavening beneficence may creep into the speech habit of the masses that form the citizenship of our many-dialected and foreign-influenced country.

Then there is, of course, the potential influence of home life and its enfolding habits. If the doctrine of pure American speech could be

brought close to parents, and an effort made on their part to correct their own use of the mother tongue, all would be well with the child. It is not by any means a fact that the worst of vocal offenses are to be found among the poor and the ignorant. Some of the most atrocious gaucheries of intonation I have ever listened to were from the lips of some of the so-called educated class. For them reform would be a reasonable matter and to put their vocal house in order a task of easy accomplishment.

SPEECH TRAINING FOR BUSINESS LIFE.

WILLIAM BACHRACH,

Chicago.

AT the present time the English instruction in the Commercial Department of the high schools is such as lays particular emphasis on the written work. The vocabularies used in business have become so enlarged that it seems to take a much longer time than formerly to teach the spelling that is needed in business. We do not, however, desire to neglect the oral English, and even under existing conditions we devote perhaps one-fifth of the time to it. Much more time, of course, could be used to advantage.

When business was carried on, on a small scale, in early days, most of it was done orally. With the advent of the typewriter and the use of shorthand many of the transactions could easily be carried on by means of written correspondence. At the present time, however, the wide and increasing use of the telephone and the dictaphone, and the personal salesmanship which has never been abandoned, seem to show a new need for a training in oral English.

The difficulty that people have in getting the names of persons and places correctly over the telephone and dictaphone is largely due to the poor enunciation on the part of the speakers. It causes considerable repetition and annoyance. Business men are always exceedingly desirous of having telephone operators who have pleasing voices and clear enunciation. They claim that the impression made by the voice of the telephone operator upon the customer is of great importance to them.

Business men nowadays make personality one of their principal requirements and they usually include in personality the tone quality and distinctness of utterance.

Last year I had great difficulty in obtaining the co-operation of the business men in the matter of giving talks to high school students. Very few of these men could give the students the benefit of their experience by means of oral expression. They could have done much better perhaps had they been permitted to write their messages.

. Oral expression is in danger of becoming a lost art, I fear, and any agency which can assist the promoting of it will be beneficial. The statement has been made that fifteen per cent. of the employes in business are engaged in clerical work. If this estimate is correct it means that eighty-five per cent. are engaged in the constructive part of business, such as salesmanship, and this eighty-five per cent. would find, perhaps, a greater need for oral English than for written English. Agitation outside of the school would probably bring results more quickly than any agitation in the schools alone. The schools seem to follow the demands made by business rather than initiate new plans.

Madison and Dearborn Sts.

OPERATORS' VOICES, THEIR IMPORTANCE AND THE METHOD OF THEIR CULTIVATION.

JOHN W. BRADSHAW,

The Chicago Telephone Co.

PROBABLY in no business in the world is the voice more constantly used and the quality and distinctness of the voice of more importance than in the business of telephone operating. When one considers that the six thousand operators in the city of Chicago say at least 45,000,000 words a day and that on the possibility of their being correctly understood rests the giving of good telephone service, you will understand how true this statement is. The Chicago Telephone Company has long realized this to be true and for several years has systematically followed out a plan of instructing each operator in the proper use of her voice; with the idea of making it more distinct and pleasing to the public hearing it and of conserving it for the individual.

Such instruction is made particularly necessary since the young women who come to us for positions are as diversified a group as the people of Chicago itself, representing many different nationalities and degrees of education. The majority of Chicago people appear to obtain during their lives very little instruction in the handling of their voices and in their methods of expression. We find that our instruction work clears up many of these faults of expression and accent and tends to make the speech of our telephone girls more uniform and thus more easily understood by the public than it would otherwise be.

All candidates for positions as operators are first sent through our Operators' School, which gives a course, lasting about four weeks, designed to teach the rudiments of telephone operating. While in this school the young women are given thirty minutes per day of voice training—usually divided up into a fifteen minutes' lecture by the instructress and a fifteen minutes' recitation by the class, devoted to the practice of the points previously given them. The instructress is an

accomplished singer and elocutionist, having had several years' instruction under one of the best teachers in the city.

This course helps particularly to strengthen and develop the voice. The points emphasized are proper breath control, deep breathing, proper position of the body, a loose and free movement of the tongue, the proper placing of the voice and the importance of tonal resonance so that the voice may carry clearly and distinctly. The possibility of using the voice with that unconscious ease which causes no effort or action to the muscles of the face or throat is particularly emphasized, since where this is accomplished the voice can be used all day without feeling the slightest strain or inconvenience.

The recitation work consists of breathing and syllable exercises and the singing of scales. It is further supplemented throughout the entire school course by the instructresses in all classes requiring that the pupils observe the vocal instructions which they have received in all their recitation work.

We have found that by the time the girls are graduated from the school practically all of them use their voices well, and that in many cases a distinct improvement in the voice and its use has been noticed. Where the general work of the class-room has not been sufficient to bring any individual's voice up to a reasonable standard, she is taken aside and given individual instruction until the desired standard has been met.

After the student has been graduated and sent out to a telephone office, it has so far been found impracticable to continue giving her the voice lectures and recitation work as carried on in the school. The proper use of the voice is, however, in nowise neglected, as throughout each girl's career as an operator her work is constantly supervised by the office instructress and executive force. One of the points which is given the most careful attention is her enunciation of words and syllables and the giving of the proper inflection to them. All questions are given with the rising inflection on the last word; in "Number Please?" the Please is given with the rising inflection. After, in reply to this question, the number desired has been given by the calling party, it is repeated back to him by the operator, as, "Hyde Park 44-44?" with the rising inflection on the last 4, which brings out to the calling party that the operator is asking him a question as to whether she has received the order correctly or not. It may have been noticed

OPERATORS VOICES, THEIR IMPORTANCE.

that telephone operators distort the different digits somewhat. This has been found necessary in order to differentiate between the different ones, since several combinations such as 2 and 3, 5 and 9, and 8 and 0 are very liable to be confused.

Instructions covering this phase are quoted below from our Operators' Reference Book.

1—*Repeating calls:*

Repeat each digit of the number separately, pausing slightly between the digit or digits representing the stile strip number and the remaining portion of the number. Examples:

80 repeat as Eight Oh?

136 repeat as One—Three Six?

1478 repeat as One Four—Seven Eight?

Repeat even hundred and thousand numbers and five digit numbers as follows:

300 repeat as Three—Hundred?

3000 repeat as Three—Thousand?

3100 repeat as Three One—Hundred?

2—*Enunciation of digits and letters:*

Enunciate the digits and letters, as far as possible, in accordance with the following:

"O" to be spoken as "OH"—with a long O.

"I" to be spoken as "WUN"—with a strong N.

"2" to be spoken as "TOO"—with a strong T and long OO.

"3" to be spoken as "TH-R-R-EE"—with a slightly rolling R and Long E.

"4" to be spoken as "FOER"—with one syllable, with long O.

"5" to be spoken as "FIVE"—with a long I and strong V.

"6" to be spoken as "SIX"—with a strong X.

"7" to be spoken as "SEV-EN"—two syllables.

"8" to be spoken as "ATE"—with a long A and a strong T.

"9" to be spoken as "NIEN"—one syllable, with a strong N on the end.

In the foregoing paragraphs I have touched only on the operator's speech and its effect on telephone service and our attempts to improve it. In the placing of a telephone call, however, there are always two people involved, the subscriber calling and the operator, and it is at least of as great, if not greater importance, that the subscriber speak

distinctly as that the operator does. It is the telephone user who speaks in a clear well modulated tone of voice who receives the best and most accurate telephone service.

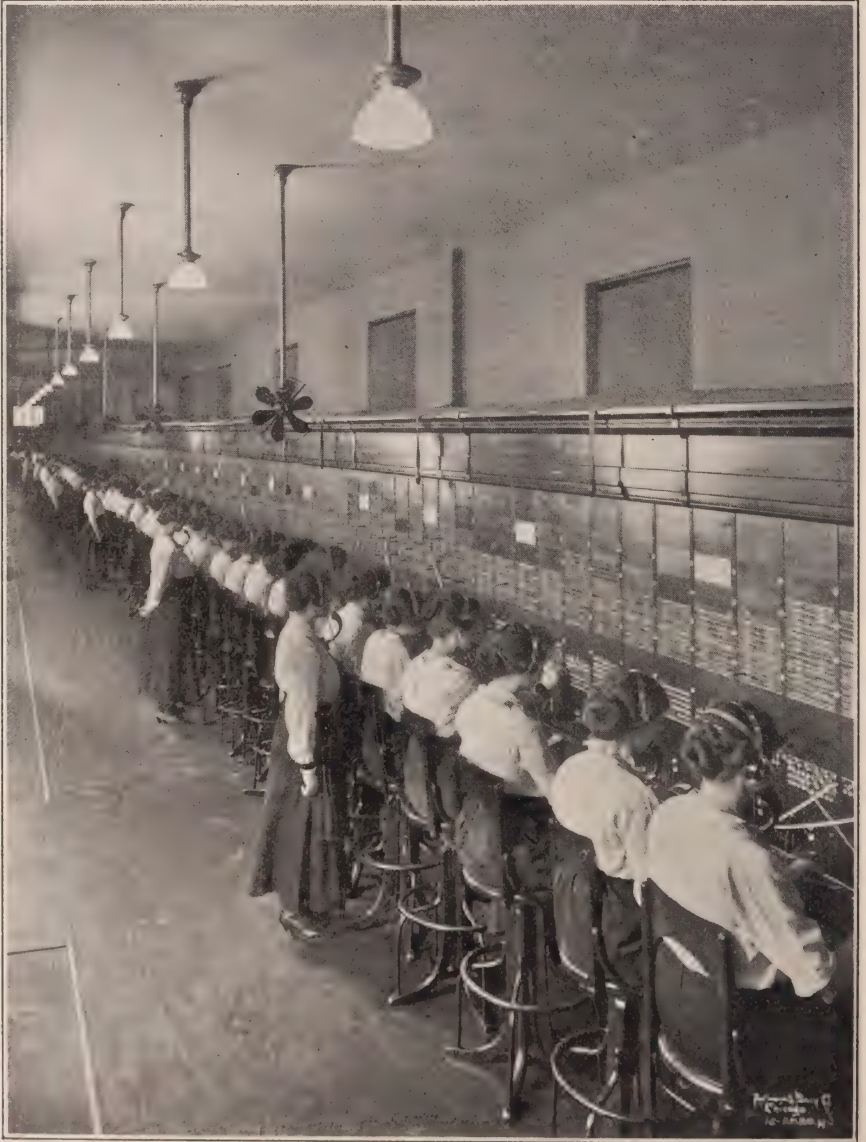


FIG. 1.—Hyde Park Office, 6045 Kendwood Ave.

This switchboard is the longest straight of way board in the world, measuring 172 ft. Its 84 positions now handle the outgoing calls

from twenty-four thousand subscribers and the operators serving it speak approximately two million one hundred thousand words a day.

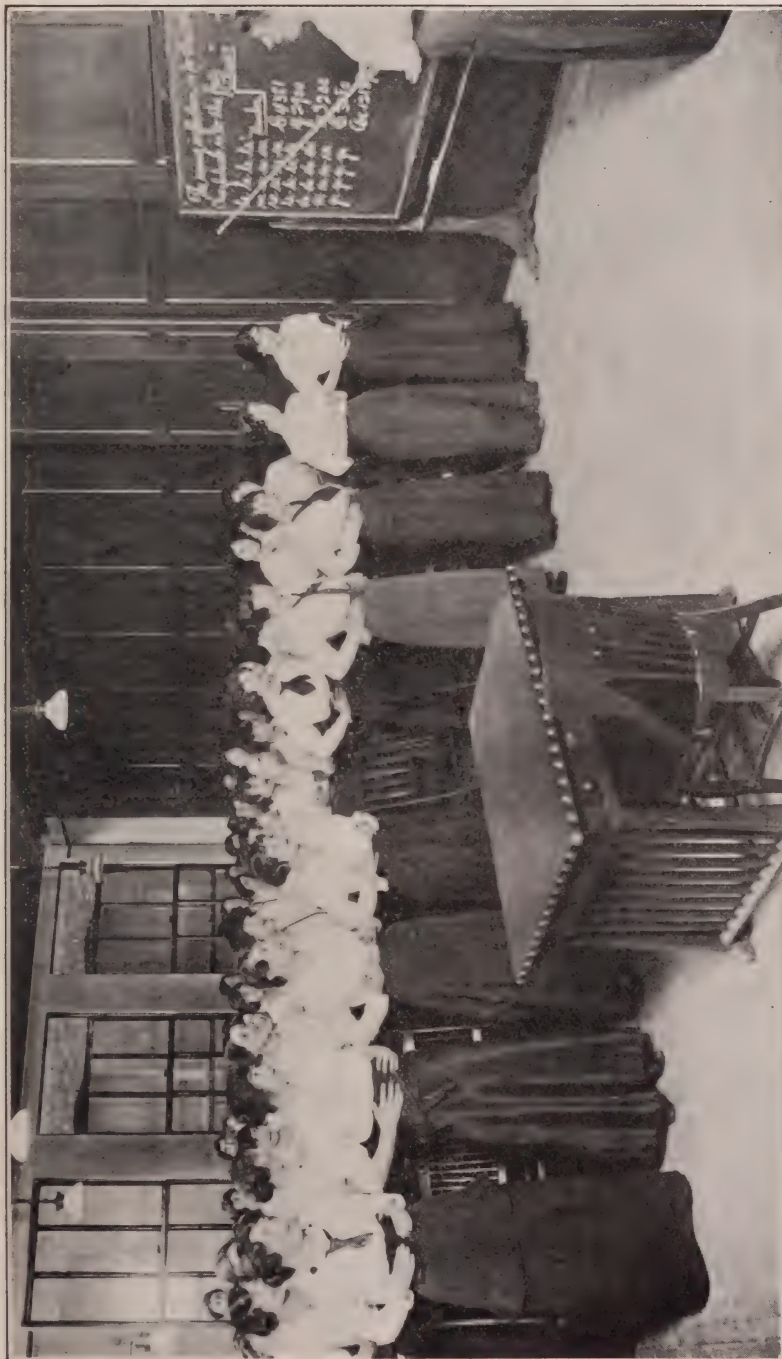


FIG. 2.—Students Practicing Voice Exercises.



FIG. 3.

THE TELEPHONE OPERATOR'S THROAT.

LEROY THOMPSON, M. D.,

Chicago.

WHEN we go into a telephone booth and call a number, how many of us ever stop to consider the amount of training and medical care the answering operator's voice had, or have thought of the efforts of the voice teachers and physicians who have taught this young lady to say "Number Please?" so distinctly and pleasantly; much less the training required to enable her to handle thousands of intricate combinations of numbers and phrases without error?

It is my effort in the following few paragraphs to tell something of this care, with special reference to the medical and surgical advice which is rendered each telephone operator in the employ of the Bell Telephone Company.

It has been estimated that 45,000,000 words a day are spoken by telephone operators in the city of Chicago alone, which is more than some of us speak in a whole lifetime. These 45,000,000 words are correctly pronounced with a smooth enunciation, that can only come from throats and accessory anatomical parts which are healthy and normal.

My close association with the Chicago Telephone Company for several years has given me an exceptional opportunity to observe first hand, in the telephone exchange and in the operator's home, the effect of voice culture, and the results have been most gratifying.

The medical staff of the American Bell Telephone Company is one of the most complete and best organized of any corporation in America, revolving itself about a medical director of international reputation, with innumerable divisions and subdivisions, which makes a study of the employes' health and its relationship to efficiency in whatever line of work the individual is especially adapted, for nothing is left undone which will prevent sickness or accident, and every effort is made to cure and relieve illness or accident as quickly and scientifically as modern medicine can do.

All applicants for employment are put through a physical examination before being accepted. Those who suffer from any defect which would materially unfit them for the position desired are rejected. Special attention is given to the throat, nose and breathing apparatus. Those who have enlarged or diseased tonsils, or who are noticeably mouth breathers, because of adenoids, or any nasal disease or deformity, are told to see a specialist and get the necessary treatment or surgical work which will eliminate the offending condition. This rule is very important, because it is absolutely impossible for an operator to even say "Number please?" and articulate the different combinations of numbers with sufficient distinctness for the high point of efficiency required in this strenuous age of business, if she has an improperly functioning throat. Those applicants having particularly harsh or displeasing voices are never taken on as operators, but are given positions in which talking is not the vital factor.

I believe that we cannot overestimate the good that is being done by such medical and surgical attention, for if the individual really wants a position, he or she will make every effort to get into the necessary physical condition, in order to pass the test.

After the operator has passed through the school of instruction and has become a regular member of the operating force, she is still under medical observation, and should any latent physical abnormality appear, it is promptly observed and advice as to cure offered.

Nothing illustrates the efficiency of this voice training and control more than to step into one of our large exchanges, where thousands of calls, both incoming and outgoing, are being handled every minute, and listen. You hear no loud noise of any kind, and even when you stand directly behind an operator, it is only with great difficulty that you hear what she is saying, and yet the subscriber at the other end of the line hears with great distinctness.

A few statistics may be of interest. All our observations and statements, by the way, are based upon such facts and not on haphazard information obtained in any other way.

In a special study made from three of our largest exchanges employing 707 girls, only 71 were found to be in a physical condition which necessitated a complete physical examination, and of the 71 there were only two taken off of duty as being too ill to work. In the 71 cases the following classification was made: General health 20.

THE TELEPHONE OPERATOR'S THROAT.

Hygienic advice needed 1. Chalazion 1. Incipient Graves' Disease 1. Simple goitre 7. Possible Graves' Disease 1. Organic heart lesion 1. Nervousness 2. Acne 3. Arterial Sclerosis 1. Hysteria 1. Anemia 9. Hernia 1. Throat 1. Possible tuberculosis 22—5 definitely proven tubercular out of the 22 suspected.

Only one throat case out of 707 employes examined speaks well for the health of the telephone operators' speaking apparatus.

I feel sure that the results of the careful voice training as it is given to the operator does not stop in the exchange, but by example and imitation extends to the home, and even the public are unconsciously affected. In making my calls in the homes of operators for investigation, I have never failed to observe that the girl who had been trained had a better modulated voice, better command of the English language than had the sisters or other members of the family, who had been taught in the same public schools, but who had missed the special training in the telephone work.

If the voice training can attain such excellent results in the telephone world, so intimately connected with humanity at large, why should not the same training be of advantage to all employes of all corporations, and to each individual using the voice in daily life?

30 North Michigan, Boulevard.

SPEECH TRAINING IN COMMERCIAL LIFE.

MARSHALL FIELD & COMPANY,

Chicago.

THE suggestion has come to the Committee on American Speech from many quarters that much might be done to improve the speech-standards of business life through the efficacy and welfare departments maintained, in increasing numbers, by large business houses. Knowing something of the work of this kind being done by the great mercantile house of Marshall Field & Company, the Committee requested from them information as to its details and an opinion as to the value of such speech-training for employes as the Committee had in mind. This request was very cordially received by Marshall Field & Company, and the accompanying communication expresses their views upon the subject.

MARSHALL FIELD & COMPANY

STATE, WASHINGTON, RANDOLPH AND WABASH

Chicago

February 28, 1916.

Professor John M. Clapp,
Vice-Chairman Committee on American Speech,
Chicago.

Dear Sir:

The points suggested in your recent communication with regard to the work of the Committee on American Speech are of decided interest in connection with the efficiency and welfare work which we are already doing in this store, an outline of which we give you herewith. We do not feel that we have completely solved the betterment problem among our nine thousand employes, but we have in times past adopted such ideas as seemed most desirable in a business of this kind, and are making additions as rapidly as practicable.

Our policy, it should be said, regarding employes is to consider them as individuals, intelligent, loyal and satisfied. In our efficiency and welfare work we avoid in every way possible all appearances of

paternalism. We find our employes ready to co-operate with us to a very gratifying degree.

We encourage employes to be as courteous to each other as they are to customers, promoting the thought that we are all members of one great store family. You will find a bulletin covering this on page sixty-one of our Rule Book which we send you herewith. One rule throwing about our young women an atmosphere of protection is that they report for duty at 8:30, while the young men report at 8:00; the young women leave at 5:20 and the young men at 5:30.

We seek to promote in every way the comfort of our employes. We have double filtered drinking water, and our ventilation and toilet room facilities are exceptionally good. We have a lunch room where employes may bring their luncheon or be served cafeteria style at the lowest possible cost. An average of three thousand are being served daily at an average price of eleven cents. In our reading rooms (one for men and one for women) we have the daily papers, such magazines as we think of interest to employes and cases filled with books. We have established in these rooms a sub-station of the Chicago Public Library and thus have access to all the reading matter of that great institution. The circulation of this library has increased since its establishment from 637 volumes to 6,000 volumes per month. Two rest rooms are on the tenth floor, one for men and one for women. In the women's room we frequently introduce special entertainment at the noon-hour which may consist of vocal or instrumental music or a reader. We have a baseball association for the young men, made up of from four to six teams at the retail and wholesale. Picked teams from the two houses contest at the time of our Annual Field Day for the John G. Shedd Trophy Cup.

Employes receive two weeks' vacation at full pay each summer. When detained at home because of illness they are given half pay. We encourage enlistment in the militia, and young men who join are given the extra week each year necessary for encampment. By regular arrangements we provide that those called for jury duty suffer no loss of pay on that account. We have a fire brigade on each floor and give members extra vacation each year. We give employes, moreover, special prices on goods purchased for their own use, which prices mean a substantial saving to them.

Appreciating that in a business so large as this it is difficult to give

those starting business life the personal attention which they should have, one of our superintendents has been designated to give the junior help special care, and he devotes much of his time to making sure that each girl or boy gets every raise of salary or other attention to which she or he is entitled. All of our men and boys know that they may go to this superintendent at any time relative to any matter which may concern either their business or private life, while a very competent woman looks after the personal work among the girls.

We desire, of course, in every way to encourage our employes to maintain and increase their efficiency. In the first place as regards health. Our house physician devotes his entire time to this business. He does not prescribe, but is of great service in an advisory way, co-operating with the employe's home physician. Through him we make a thorough study of the home life of those in our employ. Thus we come to know first causes of many troubles; we learn of health conditions and influences for good or bad that enter into the lives of employes while absent from business. The young women have a dryer in the building where they may dry their skirts and shoes in wet, sloppy weather. A graduate nurse is in charge of the two medical rooms which are in the building for emergency cases. We maintain wards in two of our city hospitals and are in close touch with two sanatoriums for the care and treatment of the tuberculous. We are pleased to say, however, that we have had very few cases of the latter. In this connection we note with much interest your suggestion that closer attention to all phases of hygiene of the nose and throat would still further promote efficiency by lessening susceptibility to various throat ailments.

In the second place, as regards efficient comprehension and despatch of their work. When first engaged all salespeople are sent to the Study where, by means of charts and lectures, they are taught what sort of checks to issue under all circumstances. In the afternoon they are examined with reference to the lessons taught. They usually "pass" at the end of one day. If any require two days that amount of time is granted. If they cannot "pass" at the end of the second day, they are paid for the two days and sent their way.

Those who become regular members of the staff are constantly encouraged to improve. One room is set apart for "Salesmanship Conferences," the objects of which are to teach right thinking toward

the work as a profession, a knowledge of merchandise and scientific salesmanship. Promptness, courtesy, intelligent attention and regard for the customer's interests are points carefully covered in these conferences. That employes may have a more intimate knowledge of the merchandise they sell, educational motion pictures have been made showing every detail of textile manufacturing, from the gathering of cotton in the fields, through all the processes of spinning and weaving to packing and shipping. We wish our employes to think for the house and offer rewards for suggestions regarding any point which in their judgment can be bettered.

You will be particularly interested, doubtless, in our school for the junior help, to which we send boys and girls for two hours each day to study arithmetic, spelling, grammar and penmanship. This time is given them during the business hours in order that they may get for themselves what they were deprived of as children. With the completion of the course each receives a diploma equivalent in the studies covered to that given to grammar school graduates.

We have a Choral Society of two hundred members who rehearse every Monday evening and give a concert each year. They began with part songs, but have since rendered "The Creation," "King Olaf," Mendelssohn's "Hymn of Praise," "Coleridge-Taylor's "Hiawatha's Wedding Feast," Mendelssohn's "Elijah," "The Swan and Skvlark," "The Light of Life," the "Golden Legend" and "Olaf Trygvasson." All members of the Choral Society who attend 75 per cent. of the rehearsals each year are given extra vacation.

Your inquiry as to the desirability and practicability of definite instruction in the use of the voice, as a part of the training of employes, opens a new and interesting field. At present the utterance and the voice quality of employes receive attention incidentally, of course, and particularly in connection with the use of the telephone, in which care for distinctness and easy tone are sought. Whether definite instruction in these matters is practicable under the conditions of such a business as this, we are not as yet able to say. That improvement in the standards of voice and speech, if practicable, would be promotive of efficiency is manifestly true. We should be glad to learn more of your ideas on this matter.

MARSHALL FIELD & COMPANY.

If we have failed to cover any special points, we shall be very glad indeed to answer any questions you may see fit to ask.

Yours very truly,

MARSHALL FIELD & COMPANY,

By W. B. TOWSLEY,

Superintendent of Efficiency and Welfare.

A NEW ERA IN VOICE STUDY.

BURTON HASELTINE, M. D.,

Chicago.

FEW things pertaining to art or science have remained so long in a chaotic state as the study of the human voice. This is equally true whether we consider voice study from the medical standpoint or with a view to voice cultivation as an art.

The conflicting theories and "methods" of the many more or less professional voice teachers all over the world are notorious. When a really successful artist emerges from the muddle of the "schools" one is almost led to wonder whether he did so because of, or in spite of his training. The uncertainty is increased in many a case when a fine voice is lost after a period of brilliancy because of some alleged fault in the method of its use.

No discriminating critic can study the results of voice training even in our best school with any feeling of satisfaction. If we examine the literature of the subject we arrive almost at the stage of hopelessness. Perhaps any attempt to teach a so subtle art by means of text-books is hopeless but at least a discussion of the subject should be free from silliness. Much of the material found in supposedly standard books upon voice culture is almost unbelievably silly. One "teacher" tells us that there are three lobes of the lung—one for the lower, one for the middle and one for the upper register in singing! From the superior register, he says, we have the high pitched tones of the voice, because they originate from the small and short air-column supplied through the superior branch of the bronchial tubes. This is the extreme of silliness but notions only a little less fantastic can be found in almost any book upon this subject. The false conception of low tones as "chest tones" and high tones as "head tones" is almost universal, many writers even placing the highest head tones as far upward as the frontal sinus! The truth of course is practically the opposite of this, since the highest notes are those in which the head cavities are used the least, while the frontal sinus is the one cavity that has no effect whatever upon vocal resonance.

One of the world's greatest singers tells us in a well known book on "How to Sing," that the pupil must learn enough physiology to know how to draw the soft palate up against the hard palate. Again this writer says: "The palate must remain elastic from the front teeth to its hind-most part." It is difficult to understand how anyone can imagine the palate near the front teeth as being elastic, while a person who could draw the soft palate up against the hard palate without a surgical operation would be remarkable indeed.

These and many other confused statements seem to result from the attempt of an artist without physiological knowledge to describe the complex act of singing merely from the sensations experienced. Great mischief results from the notion that exceptional singers are reliable instructors in voice physiology and voice training. It is much as if the juggler or the acrobat should assume to teach physiology, hygiene and medicine because he can make his body perform feats impossible to scientific men.

If now, we look at the other side of the picture we find it not less gloomy. What have the physicians taught us about the art of voice development and what aid have the specialists to offer the aspiring artist? Very little we must confess. In certain of the grosser abnormalities effective and safe treatment is now being given, but so much of bungling has been done that the vocal artist will long stand in just fear of the throat specialist. If we are called upon for instruction or advice regarding the normal development of voice or its correct or incorrect employment, our resources are indeed meagre. It would seem apparent that the first requisite for instruction in the subject is a thorough knowledge of the anatomy, physiology and the acoustic principles involved in voice production. The individual well grounded in all these matters is exceptional both among physicians and voice teachers. Neither is there any school of music or of medicine where adequate instruction of this kind is given.

Only recently has there been a start made in the right direction and one that seems to promise for the future a really scientific system of voice measurement, voice production, and voice training. This beginning, we should be proud to say, has been made by one of our profession although professional training contributed little to his success.

We refer to the work of Dr. Floyd S. Muckey, of New York, in his effort to place the subject of voice study upon a really scientific

basis. Dr. Muckey's work is not altogether recent as it has covered a period of some eighteen years, but its results are only beginning to be generally known.

He seems to have begun, and wisely, by ignoring the teaching and even the nomenclature already in current use. He enlisted first the aid of an eminent scientist, neither a singer nor a doctor, Professor William Hallock, of the Department of Physics, Columbia University. These two men conducted an investigation of voice phenomena based solely upon the known facts of anatomy, physiology and the physics of tone production. This investigation entailed the invention and construction of apparatus for analyzing the voice, for photographing the vocal cords while producing tone and the employment of many kinds of scientific instruments found only in a well equipped physical laboratory. It is not strange, therefore, as Dr. Muckey says, that voice teachers have not solved these problems. They have neither the preliminary training nor the facilities for doing such work.

An outline of the results of this investigation has recently been published in a volume, entitled *The Natural Method of Voice Production*, by Floyd S. Muckey, M. D., C. M., issued by Charles Scribner's Sons, New York. This is not a large nor formidable looking book but it begins a new era in voice study. It is by no means light reading as it demands close attention even from those well prepared for it. For the untrained reader some study will be required, fully to understand the work, but such study will amply repay anyone interested in the singing or speaking voice.

In the analysis of voice production Dr. Muckey's work has the flavor of finality and it clears this field of all the trash that has encumbered it. It is refreshing to turn from the highly imaginative work of the theorists to his simple and photographic demonstrations. His astonishing photographs of the larynx during phonation well illustrate this point and are here reproduced from the book through the courtesy of the publishers. The author's description of the cuts is as follows:

Fig. 6 shows four photographs of the vocal cords, looking down upon them. The front attachment is out of sight at the bottom of the pictures, being covered by the epiglottis, i; I is the cords themselves, with the apparent slit, k, between them; at the back, bb, are the arytenoid cartilages. The "vocal muscle" is attached to the outside of

the arytenoid cartilage at a point near *n*. It extends forward through the thick part of the cord and is attached near the cord to the front of the thyroid. When these muscles are contracted they cause the arytenoids to rotate around a point near *bb*, throwing the forward ends, *o*, inward toward each other. This rotation of the arytenoids results in a shortening of the effective length of the cords and a consequent raising of the pitch. In I and II the person is singing low G, and the whole length of the cord is in vibration. III shows the position when the octave of low G is sung, and IV when the two octaves

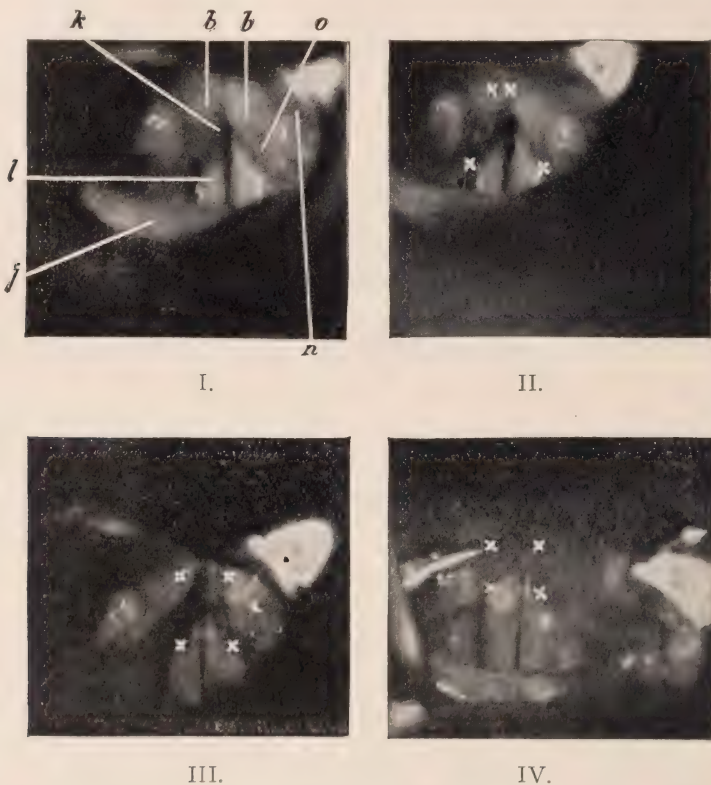


FIG. 6.—The vocal cords while producing tones of various pitches.

above low G is the pitch. A comparison of II, III, and IV, especially as to the position of the crosses marking the front and rear angles of the arytenoids, will show how the cartilages are rotated and the cords shortened as the pitch rises.

Imaginary lines connecting the front and rear crosses on each side mark the inner edges of the arytenoid cartilages. In II this line makes a decided angle with the vocal cord. In III this line is nearly parallel

with the cords, and in IV the line is parallel with the cords. The position of these lines in the photographs should make the relative position of the cords and cartilages very clear. This change in the position of the arytenoid cartilages has the effect of pressing the cords together at the back, thus shortening their vibrating length.

For the low G, as shown in II, the cord is vibrating in its full length. For the middle G a very considerable shortening of the vibrating length of the cord is shown. In IV, where the high G is being produced, the cord is practically shortened one-half. This shortening alone would give a rise of an octave in pitch.

It must be remembered that these are actual photographs of the cords while producing tone. They have not been retouched and therefore show the actual condition or changes which occur in the relative positions of the cords and the arytenoid cartilages in the production of these various pitches.

It would seem that in matters of standardization and nomenclature we now have the means for making a new start with prospect of real progress. The application of the new principles to the care and development of voices is a matter that is still *sub judice* but some valuable readjustments can hardly fail to result.

A condensed outline of our present knowledge of voice production is given in the following statement of principles formulated by Dr. Muckey, which are printed in the book as adopted by the New York State Music Teachers' Convention, June, 1915.

STANDARDS OF VOICE PRODUCTION.

From the Standpoint of the Listener.

I. Sound is a sensation produced through the organ of hearing by means of air-waves.

II. Pitch is that characteristic of the sensation of sound which depends upon the rate at which the air-waves strike the ear-drum.

III. Volume is that characteristic of the sensation of sound which depends upon the extent of motion in the ear-drum.

IV. Quality is that characteristic of the sensation of sound which depends upon the manner of motion of the ear-drum.

From the Standpoint of the Producer.

V. Voice is sound or air-waves. Vocal tone is always complex,

being composed of several simple tones (fundamental and over-tones), varying in pitch and in intensity.

VI. Voice production is sound or air-wave production.

VII. Sound, air-wave, or voice production necessitates the use of a mechanism which has three essential elements:

1. A vibrator to originate the air-waves.
2. A pitch mechanism to determine the rate at which the air-waves are originated.
3. A resonance mechanism to reinforce the air-waves started by the vibrator.

VIII. In the voice mechanism the vocal cords serve as the vibrator; the cartilages and muscles of the larynx form the pitch mechanism; and the cavities of the pharynx, mouth, and nose form the resonance mechanism.

IX. Pitch of the voice is determined by the length, weight, and tension of the vocal cords.

X. Volume of voice depends upon the extent of vibration of the vocal cords, which is caused by breath pressure, and upon resonance.

XI. Quality of voice depends upon the vibration of the vocal cords as a whole and in segments, and upon resonance.

XII. Vocal resonance, which is by far the most important factor in voice production, is due to the sympathetic vibration of the air in the resonance cavities.

XIII. Resonance is more important than breath pressure in relation to volume of tone and more important than the segmentation of the vocal cords in reference to quality.

XIV. Correct voice production, or the action of the mechanism which produces the perfect vocal tone, consists in the free vibration of the vocal cords, the free motion of the cartilages and muscles of the larynx, and full use of the resonance space. This action produces the natural voice, or the voice which nature intended a particular mechanism to produce.

XV. Any muscular contraction which prevents the free vibration of the vocal cords, the free motion of the cartilages and muscles of the larynx, and full use of the resonance space is termed an interference.

XVI. The principal forms of interference are:

1. The contraction of the muscular fibers of the false cords, which prevents the free vibration of the vocal cords.
2. The contraction of the muscles of the soft palate, which prevents the use of at least one-half the resonance space.
3. The contraction of the muscles of the chin and of the back of the tongue, which prevents the correct action of the pitch mechanism.

XVII. Every form of interference leaves its impress on the quality of the tone. The ear of the teacher must be trained to hear in the tone quality the interference with the mechanism. This is the first step in the removal of interference.

XVIII. The ability to remove interference is based upon a knowledge of the nature of the vocal muscles and of the interfering muscles, viz., the vocal muscles are involuntary and the interfering muscles are voluntary. Correct action of the voice mechanism must be induced and cannot be forced. On the other hand, interference, being under the control of the will, can be eliminated.

XIX. The principal business of the voice teacher is to develop the voice.

XX. Voice development consists in the development of the vocal muscles.

XXI. The principles of muscular development require alternate contraction and relaxation without strain. Short tones give the alternate contraction and relaxation required for the development of the vocal muscles. Removal of interference eliminates strain; hence, short, soft tones without interference form the ideal exercise for voice development.

XXII. The laws which regulate voice production are precisely the same in every singer and speaker.,

XXIII. Every mechanism which produces the voice is exactly similar. It is composed of the same elements—vocal cords, muscles and cartilages of the larynx, and resonance cavities.

XXIV. All vocal cords are of the same material—yellow elastic tissue.

XXV. In correct voice production, the action of the muscles and cartilages of the larynx is precisely the same in every individual.

XXVI. Those conditions which give full use of the resonance space are identical in every speaker and singer.

XXVII. Differences in the size and shape of the elements of the voice mechanism account for individual characteristics of voices.

XXVIII. The art of singing is composed of two elements, viz., the art of voice production and the art of interpretation.

XXIX. The art of voice production is based upon the facts of anatomy, physiology, and physics. These facts apply to every voice mechanism with equal force and in precisely the same way, and are therefore impersonal.

XXX. The art of interpretation is based upon the personal experience, knowledge, musical taste and feeling of the singer, and is therefore individual.

XXXI. This being true, it is evident that the art of voice production may be standardized, as the same set of facts may be used to measure the product of every mechanism.

XXXII. It also follows that the art of interpretation cannot be standardized, as each singer's interpretation is based upon a different set of facts.

XXXIII. As there is but one set of facts underlying the art of voice production, there can be but one standard method, and this must conform in every particular to these fundamental facts.

XXXIV. Method in voice development is not only possible, but absolutely essential, while method in interpretation is an impossibility.

122 South Mich. Ave.

Journal of Ophthalmology Otology and Laryngology

Vol. XXII

MAY, 1916

No. 5

Editorial

THE O., O. AND L. MEETING

THE 1916 Annual Meeting of the O., O. and L. Society promises to eclipse all predecessors. As previously stated in the JOURNAL, an innovation is presented this year consisting of a double session, the first consisting of two days in New York devoted exclusively to clinical demonstrations, surgical and medical, in our specialties and in work on our border-line, such as cleft palate operations, intracranial surgery, X-ray demonstrations, etc. The preliminary announcement of the plans of our enthusiastic New York specialists abounds with veritable clinical feasts.

The Baltimore session promises equally as much from a scientific standpoint. Many papers are promised besides the list presented herewith, which altogether insures a profitable two days to be spent in the Institute City.

The following papers are ready:

"A Unique Eye Injury"Dr. Fred. L. Lewis, Buffalo, N. Y.
"Phlyctenular Conjunctivitis and Keratitis,"

Dr. Henry L. Gowens, Philadelphia, Pa.

"The Value of Perimetry. A New Instrument and Some Experiments Described"Dr. Elmer J. Bissell, Rochester, N. Y.

"Paralytic Strabismus; A Simple and Accurate Method of Determining the Affected Muscle".....Dr. F. G. Ritchie, New York, N. Y.

"Injuries to the Eyes from Broken Lenses and Spectacle frames: Are They Common? What Influence Should They Have on the Kind of Frames Ordered?..Dd. C. A. Harkness, Chicago, Ill.

"The Seating of our Children in the Public Schools and Its Relation to Defective Eyesight"....Dr. J. Holbrook Shaw, Plymouth, Mass.

"A Lantern Slide Talk on the Neurology of the Ear,"

- Dr. George W. Mackenzie, Philadelphia, Pa.
"A Case of Mastoiditis" Dr. G. N. Seidlitz, St. Louis, Mo.
"Pseudo Case of Mastoiditis, Cured with Rhus Tox.,"
Dr. Mary L. Lines, Brooklyn, N. Y.
"The Present State of the Lumbar Puncture in Otitic Disease,"
Dr. Neil Bentley, Detroit, Mich.
"The Cautery in Nasal Surgery,"
Dr. A. A. Eichenberry, Indianapolis, Ind.
"What Should the Homoeopathic Surgeon Do For Adenoids and Hypertrophied Tonsils?" Dr. J. B. Garrison, New York, N. Y.
"Treatment of Benign Growths of the Larynx by the Roentgen Ray,"
Dr. G. J. Alexander, supplemented by Dr. F. W. Frank,
Philadelphia.
"The Relief of Pain in Malignant Disease of the Throat,"
Dr. Thomas L. Shearer, Baltimore.
"Observations on the Modified Lothrop Operation for Empyema of the Frontal Sinus." George B. Rice, M. D., Boston.
A paper—Subject to be announced later. Dr. G. J. Palen, Philadelphia.
The dates are: New York, June 23d and 24th; Baltimore, June 26th and 27th. Your officers hope to see a record-breaking attendance.
Very fraternally yours,
DR. IRA O. DENMAN, *Sec'y*,
Toledo, O.

PRELIMINARY ANNOUNCEMENT OF THE O., O. AND L. CLINICS.

To be held in New York, June 23rd and 24th.

ALL of our members in New York are working energetically to secure ample material for two full days of clinical work.

Operative clinics will be held all day long on both Friday and Saturday at the Ophthalmic, Flower and Hahnemann Hospitals.

The Committee will publish in the June issue of the JOURNAL exactly what operations will be made and by whom.

In order that members *may get close enough to the operating table to witness every detail of the operation*, it is planned to issue cards to each clinic so that every one can see and no clinic be overcrowded. *These cards will be issued in the order of application*, and so far as

possible to give every man a fair show to see what he most desires. The number to attend each operative clinic will necessarily, from the character of the work, be limited but there will be ample room and material for all the non-operative clinics.

The indications are that there will be a very large attendance, and in order to see what they most desire members must know by June 1st if they are coming so that immediately upon receipt of the June issue of the JOURNAL with detail plan of each operation and operator they can select the ones they most desire to see, and must not be disappointed if we are compelled to assign them their second or third selection as the rule will be. "first come first served."

In the arrangement of operative clinics it has been the aim of the Committee to confine the work largely to original operations and to the newer operations, and as far as possible to show several different operations for the same condition so that the different methods may be compared. In accordance with this plan experts in special operations from all parts of the country have been invited to make their special operation, and if any member of the Society has any special or original method he desires to exhibit and will communicate with the Committee at once we will endeavor to make room for him and if possible provide a case.

For example, we have already provided for four different reefing, tucking, or advancement of ocular muscles, for three different glaucoma operations, three different methods of removal of the lachrymal sac, five or six different tonsillectomies, etc., etc. There will be cataract extractions, enucleations with implantation of rubber ball, iridectomies, tenotomies, mastoid, sinus and nasal operations, and we hope the demonstration of the manometer and tonometer on the living eye.

At the Ophthalmic Hospital there will be an innovation that the Committee believes will prove most attractive and instructive, that is, the exhibition of rare and interesting non-operative cases. For this we are sure of having at least fifteen or twenty cases of various choroidal diseases, probably as many cases of retinal and optic nerve diseases of various types and stages, several cases of glaucoma, detached retina, and other fundus cases: one typical case of the extremely rare disease of amaurotic family idiocy is lined up for this exhibition. Rare dis-

cases of the conjunctiva, cornea, iris, lids and lachrymal apparatus can also be seen.

In the throat and ear clinic especial attention will be given to the therapeutic treatment of both rare and every-day diseases of these organs.

This examination of cases will be going on Friday and Saturday afternoon from two to six at the same time operations are being held, so that every one is assured of having something of profit to see during his visit.

Among the many good things hinted at above, we wish to call especial attention to the particularly interesting work provided for along the border line of our specialties. Dr. George W. Roberts will make one of his original hare-lip and cleft-palate operations with the exhibition of several cases. Dr. William H. Bishop will operate a brain abscess or tumor. Dr. William H. Dieffenbach will show and give a little talk on the reading of X-ray plates. Dr. F. M. Dearborn will give a demonstration of fulguration and carbon dioxide snow on border-line conditions. Dr. M. W. McDuffie will demonstrate the use of radium. Dr. T. Drysdale Buchanan will demonstrate on the cases to be operated five or six different methods of anesthesia.

The above is simply an outline of the day's work. On Friday evening we will have, through the kindness of Dr. Frederick M. Law, of the Manhattan Eye and Ear Hospital, an opportunity of seeing probably the finest collection in existence of X-ray plates of sinus conditions. Dr. John E. Wilson will give us what we believe will be a most useful and instructive talk on the Neurological Aspect of Ophthalmological Problems, and our own Dr. Palen will exhibit his especially fine collection of lantern slides of the temporal bone and sinus—a most interesting, valuable and instructive evening.

After two full days of hard work Saturday evening will wind up the New York part of our annual meeting with a dinner at the Hotel Headquarters, to be announced later.

NEW YORK LOCAL COMMITTEE.

CONCERNING THE O., O. AND L. MEETING.

IN this issue of the JOURNAL will be found the preliminary announcement by the New York committee of the program for the Clinical Session of the O., O. and L. to be held June 23rd and 24th. The headquarters will be Hotel Woodward, Broadway and 55th Street.

The New York committee have worked very hard to make this session in the Metropolis a memorable one in the annals of the O., O. and L. and we trust that no member will fail to take advantage of the unparalleled opportunities for brushing up which this session is going to offer us. The completed program will be announced in full in the June issue. In the meantime secure your accommodations ahead, for New York in June is crowded, and it will be especially so this year.

In Baltimore the headquarters will be at "The Emerson," the same as the Institute. The program for the two day session here will also be published in the June issue, and by the way it is lining up, it promises to be at least on a par with the New York clinics. Don't fail to cut out of your business book June 23-24-26-27. You will never forgive yourself if you miss this session.

W. H. P.

IT is with a considerable degree of pleasure that we call your attention to the preliminary announcement of the O., O. and L. clinics to be held in New York, June 23rd and 24th, which announcement appears in this issue of the JOURNAL. We feel that President Phillips has certainly started something in his plans for the meeting this year. The idea of having a two days' clinic preceding our regular session is new and the prospects are that it will be a session which we will wish to continue from year to year. Our good friends in New York are bending every effort to make the affair a great success, and if the preliminary announcement is merely a "preliminary announcement" and the real thing comprises much more than they have already given us, it will be a regular American Congress before we get through. The beautiful thing about it all is that they have the material in great abundance and judging from the early statement of what has already been done, they have the wonderful spirit of co-operation which will bring together a tremendous showing.

We wish to emphasize what the committee has already said,

namely, that in all probability there will be a very large attendance and that, in order to see what each man most desires to see, every one should attend to his reservation early. The June issue will contain more complete details of the plans, but do not wait even for the arrival of that number before making up your mind and writing for reservations. If it is possible, arrive in New York Thursday evening or very early Friday morning, so that the clinic may begin on time that the amount of material may be properly demonstrated.

D. W. M.

POST-GRADUATE FACILITIES IN PHILADELPHIA.

THE facilities Philadelphia offers as a teaching center for the post-graduate student cannot be surpassed in this country. Analysis of the opportunities:

1. Twenty-five hospitals have special clinics devoted to eye, ear, nose, and throat work.
2. All these clinics are open to visitors.
3. A daily list of operations, their time and place, is supplied to the student.
4. The Library of the College of Physicians and Surgeons, the Mütter Museum, and the Wistar Institute of Anatomy offer the most thorough means of perfecting the academic side of special education.
5. The small private class teaching is ideal.
6. Throughout the winter there are many meetings where the specialist can find presented particularly fresh and interesting papers.

Upon an average day in the Philadelphia hospitals there were fifty-two eye, nose, and throat operations, only sixteen of which were adenoidectomy and tonsillectomy. (This number does not include ear operations.)

There are actually hundreds of cases visiting the clinics daily.

D. M.

SYMPOSIUM ON GLAUCOMA.

DR. DEAN W. MYERS, the Associate Editor for this issue of the JOURNAL, has spent considerable time and effort to make the Symposium on Glaucoma one of worth. He has succeeded in collecting a series of contributions from authoritative sources cov-

ering all phases of the subject. The results of his efforts will no doubt be appreciated by the subscribers no less than they are by the editor.

G. W. M.

THE associate editor wishes to express his great appreciation to the men who have contributed to this number of the JOURNAL studies upon the various phases of Glaucoma. An attempt has been made to cover the question from every angle, and it is the belief of the associate editor that the readers of our good JOURNAL will very much appreciate this up-to-the-minute number on this very old, interesting and inexhaustible subject.

D. W. M.

CORRECTION.

I HAVE just noticed an error in my (September) editorial upon the late Dr. A. Worrall Palmer, page 140 of the 1915 volume, and hasten to correct it for the sake of accuracy and the truth.

Dr. Palmer never held the degree O. et A. Chir., but in 1885 took the New York Ophthalmic Hospital's Certificate in Rhino-Laryngology after completing the prescribed course.

JOHN L. MOFFAT.

ANNOUNCEMENT.

IT gives us pleasure to announce that Dr. Philip Rice, of San Francisco, will act as Associate Editor for the June number of the JOURNAL. The editor welcomes the assistance of Dr. Rice at all times.

PATHOLOGY OF GLAUCOMA.

G. W. MACKENZIE, M. D., AND F. O. NAGLE, M. D.,

Philadelphia.

CONCERNING the pathogenesis of glaucoma, our conclusions are not yet fully determined. We are well acquainted with certain definite characteristic pathological findings, but there is no uniformity of opinion amongst the various investigators through what changes the complete picture of glaucoma is produced, or in other words, which are the primary and which are the secondary changes in the eye.

There are several epochs in the history of glaucoma. Hippocrates was the first author to use the term "glaukos." Although Kepler discovered the optical properties of the crystalline lens in the 17th century, it was not until Brisseau discovered the lens as the seat of cataract that there was any differentiation between glaucoma and cataract. The discovery of hardness of the eyeball as a symptom of glaucoma by Mackenzie in 1830 may be considered the next epoch of glaucoma. With the advent of the ophthalmoscope, we find simple glaucoma first differentiated. Jaeger first described the glaucomatous cup. The discovery of iridectomy as a cure for certain forms of glaucoma by von Graefe is the greatest epoch in the history of glaucoma. The next epoch may be called the pathological, because of the consistent microscopic findings about the angle of the anterior chamber in glaucoma.

It will be unnecessary to go into any minute study of the various anatomical structures concerned in glaucoma, except perhaps to give special emphasis when occasion should arise. The classical histological descriptions of the structure of the angle of the anterior chamber by Fuchs can not be improved upon, and it is needless to repeat or refer to them here. A few additional clinical facts incorporated in the Glaucoma Symposium edited by Nance and Peck we are pleased to quote as follows:

(a) "The so-called angle of the anterior chamber is a true angle and not an annular sinus. (b) The mesh work of the iris angle is a cellular structure at birth, which undergoes a progressive and physiological fibrosis with early subsequent sclerosis, until it becomes a fibrous

structure. (c) The individual strands are more than twice as large at advanced age as at birth, in consequence of which the alveoli of the mesh-work become markedly reduced in size. (d) The spongy nature of this mesh-work affords free access of the aqueous to the venous sinuses."

Czermak made a special study of the oblique entrance of the

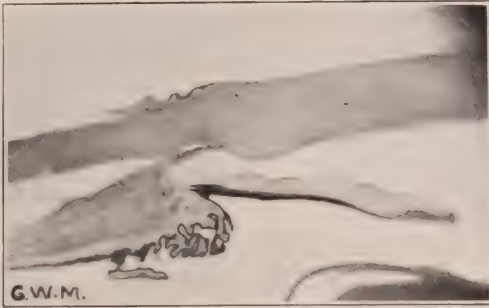


FIG. 1.—Section from a normal emmetropic eye showing the distance between the ciliary body and the equator of the lens. This figure should be compared with figures 2 and 3.

vortex veins, and proposed the theory that the closure of the perilymph spaces of the four vortex veins was the original cause of primary glaucoma. He found important changes in the vortex veins. The peri-vascular spaces and the neighboring scleral tissue was infiltrated



FIG. 2.—Section from a myopic eye showing the increased distance between the ciliary body and the equator of the lens as compared to the emmetropic eye.

with round cells. Could these changes produce a venous stasis with resulting glaucoma? It is still a disputed fact.

Concerning the significance of the angle of the anterior chamber, opinions of authors differ. Some consider the obliteration of the angle of the anterior chamber to be the result of a plastic inflammation. According to other authors the obliteration of the angle of the anterior

chamber is a secondary process, produced through increased pressure in the posterior portion of the eyeball. Still other authors suggest the theory that a nearly edematous condition of the ciliary processes takes place through which the root of the iris is pushed forward. If the

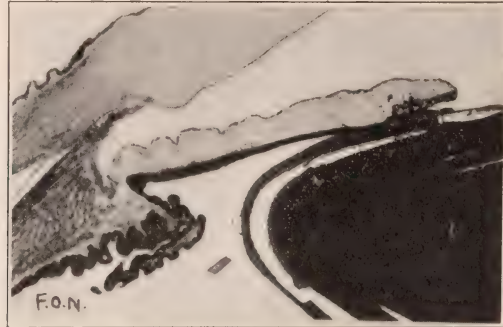


FIG. 3.—Section from a hyperopic eye showing the relatively short distance between the ciliary body and the equator of the lens as compared to the emmetropic eye.

plastic inflammation of the angle of the anterior chamber were the original cause of glaucoma, a deepening of the anterior chamber would precede the shallowing of the chamber.

So far as the glaucomatous habitus is concerned, it seems plausible



FIG. 4.—Ulcer of cornea and perforation with anterior synechia to the scar. Secondary glaucoma and secondary infection.

in view of the point brought out by Priestley Smith by his measurements of the cornea, namely, that the so-called predisposed hyperopic eye is one in which the cornea is of small diameter. Again, Priestley Smith's studies of the lens-growth is another important factor in the

glaucomatous habitus. His dictum "that the size of the lens like the tendency to glaucoma increases with age" is generally accepted by the profession. Fuchs calls this condition insufficient spatial relations between the equator of the lens and the ciliary body.

Schmidt-Rimpler and Kuschel believe that the loss of elasticity of the supporting tissues of the eyeball is often a predisposing factor in glaucoma.

On other grounds, however, it may be argued that hyperopia predisposes to glaucoma.

Regarding the tension of the eye it has been pointed out that,

1st. Tension in the vitreous and the aqueous are equal in the normal eye.



FIG. 5.—Perforating wound of cornea—anterior synechia—peripheral anterior synechia—abscess formation in vitreous.

2nd. Increased tension takes place first in the posterior chamber. This pushes the iris and the lens forward causing a shallow anterior chamber, an early sign of increased tension which may precede a glaucomatous attack.

Refraction does not influence the normal tension of the eye. Knapp, of the Basel eye clinic, in his experimental work on tension of

the eye, reports a diminution of the normal tension with each succeeding decade.

In the eye there is probably a normal equilibrium between blood pressure, tissue activity and intraocular tension. This normal tension may be destroyed by increasing the intraocular tension or lowering the tissue activity, or blood pressure; hence, glaucoma is probably not so much an increase of tension as a loss of balance between the intraocular tension and the nutritional activity. Simple glaucoma has been recognized as closely related to atrophy of the optic nerve with a deep excavation. The characteristics of simple glaucoma are the chronic clinical course leading up to gradual blindness without exacerbation, inflammation or characteristic pain.

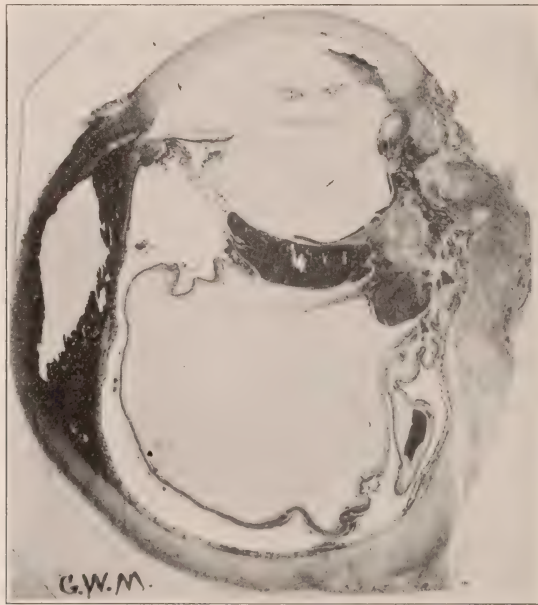


FIG. 6.—Vulnus sclera.
Pseudo-coloboma of iris.

Blood in anterior chamber behind lens and in perichoroidal space; in the latter two places it is partly organized. In region of wound iris is dislocated backward and fixed, forming a pseudo-coloboma.

Retina slightly detached. Vitreous shrunken—only slight layer of vitreous remaining.

Uthoff, Posey and de Schweinitz have suggested a logical course to pursue in the treatment of simple chronic glaucoma. In 1908 Posey reported 65 cases of simple chronic glaucoma which had been treated by miotics, of which all but seven had been observed over a period of two years, and twelve for more than ten years. The results obtained

by the constant and prolonged application of this treatment were compared with a similar series of cases treated by iridectomy. Among the percentages obtained from this analytic study it was found that central vision was maintained in the miotic series (each case of which had been



FIG. 7.—Primary Glaucoma and secondary Irido-cyclitis with pupillary seclusion.

Operated by general surgeon for primary glaucoma and secondary glaucoma occurred because pupil was entirely closed by connective tissue mass containing vessels, which is also adherent to the anterior capsule of lens. Free blood in both anterior and posterior chambers.

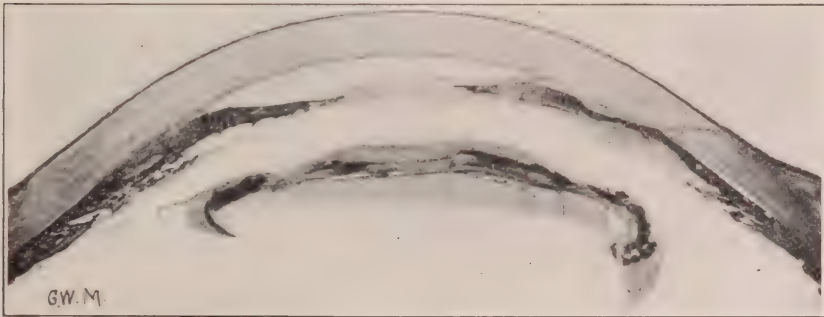


FIG. 8.—Secondary glaucoma due to seclusion of pupil. There was a small wound of the cornea which had been produced by an awl (not shown in this section). Plastic irido-cyclitis followed, which led to peripheral synechia. There is a pupillary membrane present. Cataractous condition present is due to interference with nutrition. Calcareous changes in the lens. Fluid separates the capsule from the rest of the lens. The eye was 30mm. long indicating hydrophthalmic condition of the eye. Slight edema of the epithelial cells of the cornea which shows better with higher magnification.

observed over an average period of five years) in 80 per cent. of the cases, in comparison with 25 per cent. in the most favorable group of

the iridectomized eyes. As it was pointed out at that time, just as the advocates of operative measures find beginning cases to be more amenable to treatment than those in the more advanced stage of the disease, so cases treated by miotics from the early stages give the better results

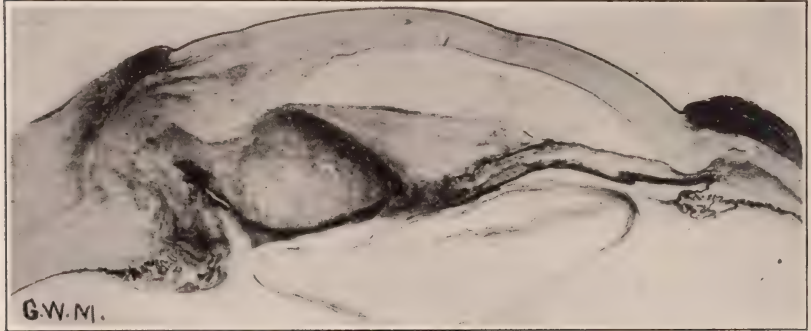


FIG. 9.—Gumma of iris, ciliary body and sclera. Exudate in the anterior and posterior chambers which differentiates this type of granulomatous formations from the strictly tumor formations.

The gumma mass is formed from granulomatous tissue which replaces the tissue which it invades.

Study of the specimen shows complete closure of the filtration angle on both sides.

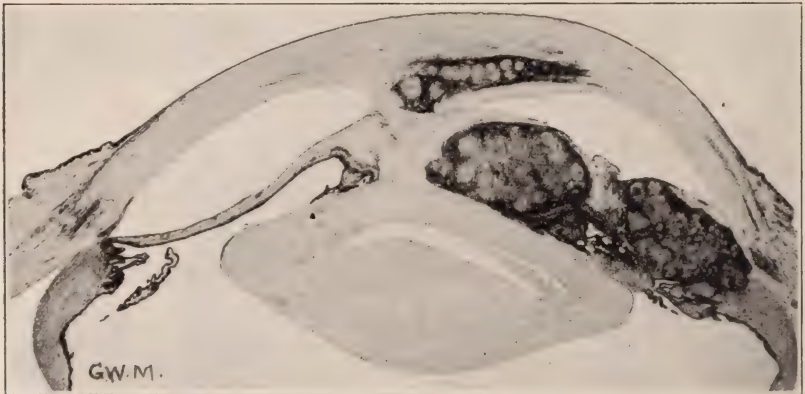


FIG. 10.—Shows Miliary Tubercle of the Iris which has also invaded the deeper portions of the cornea. Microscopic examination shows the typical picture of giant cells surrounded by epithelioid cells and around this the round cell infiltration characteristic of the granulomatous formations. The cornea was perforated and invaded. There was an anterior synechia present which accounts for the invasion of the cornea. There is also a posterior synechia which shows very plainly in this specimen.

The tuberculous infiltration of the iris has completely blocked the filtration angle.

so far as the maintenance of central and peripheral vision is concerned. This experience was verified by Posey, 1914.

The treatment suggested by Posey is to use one-fifth of a grain

of pilocarpin to the ounce of water ; strength to be increased so that at the end of a year one grain to the ounce is allowed. At the end of the second year, two grains to the ounce solution is used, and at the end of the third year, three grains to the ounce. The eserine should be employed in one-half of the strength of the pilocarpin. The pilocarpin is given during the day and the eserine at night.

Generally speaking, there are two chief theories which have been advanced to account for the rise of tension in glaucoma, the mechanical theory and the hypersecretion theory. The mechanical, or retention theory, contends that increased tension results from a mechanical obstruction to the outflow of fluids from the eye. This theory is based



FIG. 11.—Shows nodular infiltration of the uveal tract. Secondary glaucoma and ectasia of the eyeball.

The original cause was an old injury which was followed by a plastic iridocyclitis and choroiditis. The eye was removed because of a threatened sympathetic inflammation in the fellow eye. For four years previous to enucleation the eye was totally blind.

There is a distinct nodule in the iris near the pupillary margin on the left side. On the same side the peripheral synechia is marked which has the effect of shortening the free portion of the iris and making the pupil eccentric.

upon the fact, according to the researches of Knies, Weber, Collins, and Priestley Smith, that in every eye subject to glaucoma there is a predisposition to the disease because of certain peculiarities in its anatomi-

cal make-up. The peculiarities may be due to obstruction of the canal of Schlemm by the root of the iris applied against it, by structural alterations in the canal of Schlemm or by alterations in the consistency of the aqueous. If the glaucoma is of short duration the root of the iris may be merely pressed against the cornea and may be easily separated; in older cases it is usually adherent and often atrophic. Structural alterations in the ligamentum pectinatum may be due to a localized sclerosis—a theory advanced by Henderson in 1908. At the meeting of the American Medical Association at Atlantic City, in June, 1912, sclerosis of the pectinate ligament was considered secondary.



FIG. 12.—Luxation of the lens, peripheral synechia, glaucoma and ectropion of the pupillary margin of the iris.

The lens was dislocated into the vitreous, the nucleus of the lens is seen but the fibres run quite irregularly. The side of the lens toward the iris is fluid under the capsule. The lens is turned around so that the posterior pole is directed more or less forward. The lens shows considerable calcareous degeneration. The luxation of the lens is responsible for the peripheral synechia and therefore the glaucoma.

Fischer's theory of glaucoma is that increased tension is due "to an abnormal production or accumulation of acid in the eye. In consequence of this abnormal acid content the hydration capacity of the ocular colloids is raised and glaucoma results, not because water is

pushed into the ocular colloids, but because these suffer changes which make them suck in water from any available source."

This hypothesis also might suggest why the subconjunctival injection of sodium citrate in addition to alkalinizing the ocular contents, may be effective in reducing tension, *i. e.*, the amount of fluid injected beneath the conjunctiva may overcome the stagnation of the lymph passages, flush out these channels and improve ocular elimination.

The hypersecretion theory contends that increased tension is due to an increase of secretion as a consequence of some nervous form of irritation. De Wecker, Galezowski and Schweigger were the chief exponents of the hypersecretion theory. In a recent paper Lagrange holds to the hypersecretion theory, and he believes it to be the primary cause of glaucoma, the hypersecretion being due to a nervous disorder

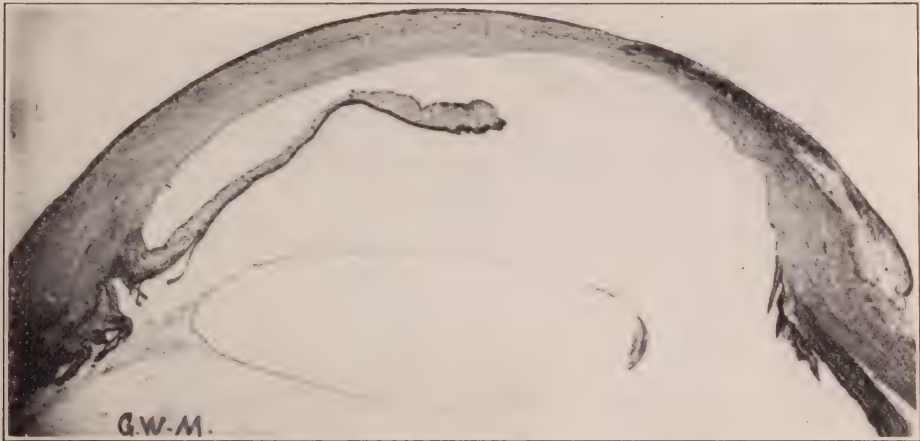


FIG. 13.—Pannus with Ectasia of Cornea and secondary Glaucoma.
Preceding all was Trachoma.

Iridectomy was performed. Note difference in thickness of cornea; on left side it is normal while on right side it is thin and ectatic.

FIG. XIV.

(excitation of the sympathetic) and to alteration in the blood of the vessels.

Our closing remarks could not find better words than those with which Priestley Smith concluded years ago in one of his articles on glaucoma. "The causes of primary glaucoma, then, are various and complex and are not yet completely known; but they are alike in this, that they all lead to compression of the filtration angle. With that compression the actual glaucoma process begins. The escape of fluid is retarded and the intraocular pressure rises, the increasing pressure

hinders the flow of blood through the choroidal veins, and augments the swelling of the ciliary processes; this, in its turn, increases the compression of the filtration angle. The fluid which still exudes from the turgid ciliary body is albuminous and less diffusible than the normal secretion; it tends to accumulate behind the lens, and this latter being pressed forward intensifies the mischief. Thus cause and effect react upon each other in a vicious circle.

"In acute glaucoma we see the vascular element at its maximum; in chronic glaucoma at its minimum; in the subacute and intermittent forms it seems to ebb and flow under various influences which aid or embarrass the circulation in the uveal tract. The vascular element finds its complement and auxiliary, more marked in some cases, less marked in others, in the predisposing structural condition of the eye."

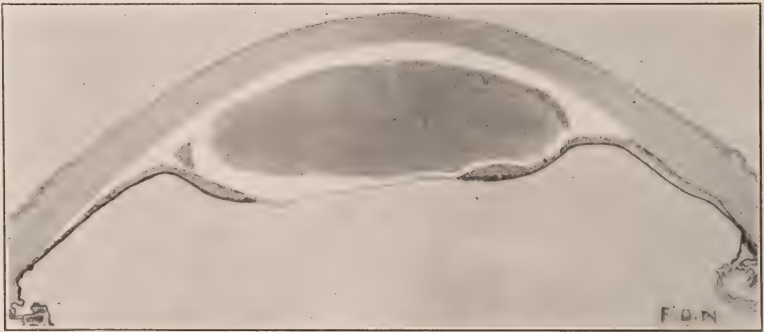


FIG. 14.—Shows anterior dislocation of lens into the anterior chamber.

SECONDARY GLAUCOMA, as its name indicates, is a condition of increased intra-ocular tension produced by any pathologic condition in the eye that is capable of interfering with the normal excretion of fluids from the eye. Therefore any pathologic condition that produces narrowing of the anterior chamber, especially about the angle, will tend to produce secondary glaucoma. Secondary changes in the pectinate ligament, for instance sclerosis, deposition of inflammatory products in the spaces of Fontana, blocking of the spaces with foreign bodies, such as lens substances, etc., may produce secondary glaucoma. Besides, any interference with the circulation in the region of the vortex veins, vascular changes coincident with age, tumors, etc., may produce secondary glaucoma.

When we come to analyze them we find a great many pathologic

conditions in the eye that may produce secondary glaucoma, among which may be included:

Perforating wounds of the cornea with resulting anterior synechia. The healing of the iris into the scar of itself causes a general narrowing of the anterior chamber. When we consider that some of these cases are followed by more or less irido-cyclitis resulting in swelling of these parts, we have an additional factor that tends towards a synechia at the periphery of the iris. The larger the injury and the more peripheral it is the greater the possibility of secondary glaucoma.

Even though the wound may heal kindly, contraction may occur later, and the iris, and with it the ciliary body, may be pulled forward,



FIG. 15.—Glioma—retinal form. Demonstrates closing of angle of anterior chamber. Excavation filled up with gliomatous tissue.

causing the root of the iris to adhere at the periphery, with resulting glaucoma.

Perforating ulcers of cornea may produce secondary glaucoma much after the same manner as perforating wounds.

Injury to the lens. This may cause secondary glaucoma by reason of swelling of the lens substance within its capsule, pushing the iris forward and narrowing the anterior chamber. In other cases the lens substance may ooze out of the capsule too rapidly to be absorbed

promptly, when the lens substance will act as a foreign body and block the spaces of Fontana.

Perforating wounds of the eye with injury to the iris and ciliary body, especially the latter. This form of injury is followed by more or less inflammation of the injured parts. The associated swelling of the iris and ciliary body may be sufficient to cause peripheral synechia and glaucoma. On the other hand, the products of inflammation, which often show themselves on the posterior surface of the cornea, may not filter well through the pectinate ligament and cause increase of intra-ocular tension. In still other cases of injury followed by irido-cyclitis, posterior synechias or pupillary membranes may form which tend toward the production of secondary glaucoma.

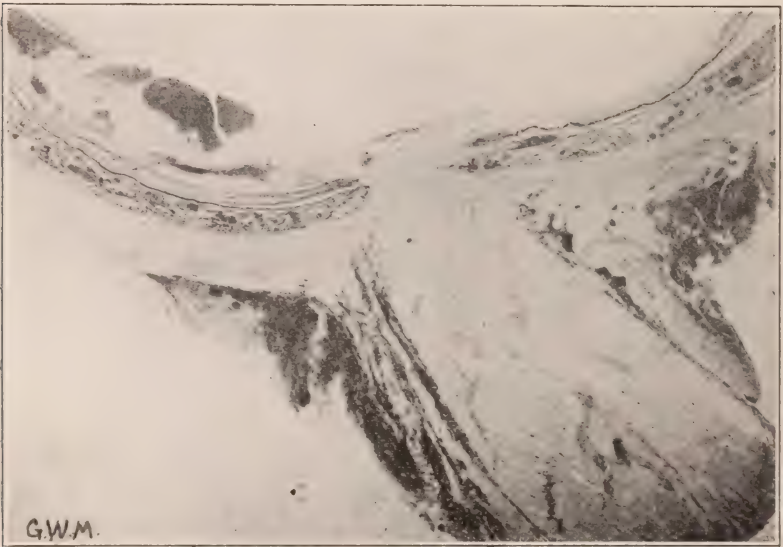


FIG. 16.—Retinitis hæmorrhagica suggesting thrombosis of the central vein. Hemorrhage of the retina was followed by secondary glaucoma.

Note hemorrhage in retina. Hemorrhage present in nerve fibre layers and inner surface of retina below limitans interna. Also hemorrhage in nuclear layer. Also abundant hemorrhage in external plexiform layer.

Seclusion of the pupil may result from iritis from injury or iritis from other causes,—rheumatic, tuberculous, syphilitic or otherwise. In seclusion of the pupil we have a more or less complete posterior synechia of the iris at the pupillary margin. It is followed by the ballooning of iris forward (iris bombé), when its root becomes engaged with the posterior surface of the cornea adding further difficulties to the normal excretion of fluids from the eye.

Occlusion of the pupil with a pupillary membrane will produce secondary glaucoma by interfering with the free circulation of aqueous from the posterior to the anterior chamber, after a manner similar to that found in seclusion of the pupil. The result is that the accumulating aqueous in the posterior chamber forces the iris and the adherent lens forward, narrowing the anterior chamber to such an extent that in some cases it is practically lost.

Nodular or granulomatous infiltrations found in sympathetic inflammation, in tuberculosis and syphilis of the iris and ciliary body, are usually followed by secondary glaucoma. Such infiltrations are rarely limited to one or the other of these tissues, except perhaps in the very earliest stage, and this is doubtful. The figures illustrating these affections show the manner in which the filtration angle becomes occluded better than can be described in words.

Changes in the pectinate ligament and canal of Schlemm afford explanation for the cause of congenital glaucoma with hydrophthalmus. This is really a secondary form of glaucoma.

Treacher Collins (Researches, London, 1896) from his examination of hydrophthalmic eyes concludes that the condition is due to the prehuman or prenatal condition where there are strands of tissue that stretch across between the base of the iris and the cornea that should have disappeared. Others believe it is due to aphasia of the venous network, and especially of Schlemm's Canal.

Operations upon the eye for the relief of cataract may be followed by secondary glaucoma. In young people the needling operation may cause secondary glaucoma after the same manner alluded to above, when referring to injuries of the lens. The risk of secondary glaucoma following discission operation increases with the age of the patient after puberty. In later life operations for the relief of senile cataract are more often followed by secondary glaucoma than is generally conceded. One of the frequent causes is to be found in a mild infection resulting in a low grade irido-cyclitis. Another cause is prolapse of one of the pillars of the coloboma. As far back as 1889 Natanson examined the records of 37 cases of glaucoma following cataract extraction. The records if collected now would show multiples of these figures.

Luxation of the lens anteriorly into the anterior chamber or posteriorly into the vitreous or laterally no matter how produced, is fol-

lowed by secondary glaucoma. It is more easy to understand how an anterior or a lateral luxation can produce blocking of the filtration angle than a posterior dislocation. Nevertheless it does.

How the anterior and lateral dislocations produce secondary glaucoma is best shown by study of figures.

Aniridia, whether of congenital or traumatic origin, may be a cause of secondary glaucoma. In the congenital cases there is perhaps also a lack of proper development of the pectinate ligament. In the reported cases of traumatic aniridia there is usually some injury to other parts, notably the lens, followed by glaucoma. In two cases reported by Treacher Collins the lens had been injured and a broad adhesion was formed between the capsule of the lens and the scar.

Intraocular tumors sooner or later produce secondary glaucoma. In the case of the iris near its periphery a tumor of comparatively small size is sufficient oftentimes to produce early secondary glaucoma, the more so if the anatomical structures are of such dimensions as to predispose to primary glaucoma. Tumors of the ciliary body increasing its equatorial dimensions tend toward a narrowing of the angle of the anterior chamber. Tumors of the choroid and retina would have the effect such as might be expected from increasing the volume of the vitreous whereby the lens, iris and ciliary body are pushed forward, narrowing the anterior chamber and resulting in secondary glaucoma.

Detachment of the retina more often results in diminution of intraocular tension. In rare cases increase of tension follows as a result of secondary glaucoma. In these cases it is more likely that there is a common factor behind both conditions than that the glaucoma is secondary to the detachment.

Hemorrhages into the retina are sometimes followed by glaucoma. The so-called hemorrhagic retinitis resulting from occlusion of the central vein is the most frequent form of hemorrhage of retina to be followed by glaucoma. There is some question as to how it causes glaucoma. It is quite possible that the same causes which produced the hemorrhages in the retina favored the products of glaucoma, viz., changes in the vessel walls, endo-phlebitis which tend toward narrowing or obliterating the lumen of the vessels.

(To be continued in June number.)

THE EVOLUTION OF THE FILTRATION OPERATION FOR GLAUCOMA.

WENDELL REBER, M. D.,
Philadelphia, Pa.

THE evolution of the filtration operation for glaucoma constitutes one of the most interesting phases of ophthalmic surgery.

It is a significant fact that as far back as 1867, DeWecker became convinced that the filtration cicatrix which he sometimes secured after his anterior sclerotomy was of more value than the sclerotomy itself. This was eleven years after von Graefe had advocated iridectomy as the *sine qua non* in such cases. And it is a nice question as to whether the iridectomies that did the most good did not leave a tiny filtration cicatrix in spite of the carefulest technique on the part of the operator. At any rate, iridectomy was found insufficient in a fair number of cases and the search for the ideal filtration operation began.

As has just been said, DeWecker suspected that a cicatrix that filtered sometimes occurred after anterior sclerotomy. Many others devised modifications of this operation, but it was not until Col. Herbert worked out his first operation that any great advance was made. Herbert conceived the idea of doing an anterior sclerotomy in the usual fashion (see Fig. 1), and then when puncture and counter-

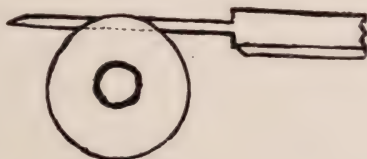


Fig. 1.

puncture had been made in the classical way, instead of withdrawing the knife he twiddled or rotated it in his fingers as one would a lead pencil. His hope was to create a ragged state of the wounds at the

point of puncture and counter-puncture and thus promote fistular healing. To make filtration even more certain he then turned the edge of his very narrow knife upward and a trifle backward, cutting upward through the uppermost part of the angle of the anterior chamber and on through the sclera for about 3 mm., making a bridge of scleral tissue about 5 mm. wide. Then the edge of the knife was turned abruptly forward so that it cut out through the sclera but left the conjunctiva intact. In Fig. 2 a and b represent the vertical sides of the



Fig. 2.

scleral incision and the upper end of the parallelogram cut in the sclera. If an iridectomy is wished for at this point the iris forceps may be passed in at either a or b, the iris drawn out at either point sideways and snipped off. This is rather a simple operation and of rather easy performance except when the anterior chamber is almost or completely abolished. This operation without the iridectomy I have done in two cases with as nearly perfect results as one could wish for. It is only fair to state, however, that in both cases the operated eyes were hopelessly blind and the operation was done with the purpose of relieving the pain in sightless glaucomic eyeballs. An important point in the technique is that the Graefe knife must be an extremely narrow one, 1 to 1½ mm. being the preferred width.* This operation as done with the iridectomy becomes an iridosclerotomy and differs only from the final effect of Lagrange's procedure in that it removes no portion of the sclera.

To make the likelihood of filtration even more nearly a certain thing Lagrange conceived the idea of excising a small piece of sclera. In boldness of conception this operation surpassed all of its predecessors, and to the everlasting credit of this operator it should be for-

*Herbert's wedge isolation operation has been adopted by a few surgeons but does not seem to make much headway.

ever remembered that Lagrange was the first surgeon who had the temerity to remove a portion of the sclera at the limbus and to do it with almost mathematical precision. It is only justice to state that in 1876 Argyll-Robertson and soon after him Strawbridge in this country and later Froelich in Germany, all trephined the sclera. But none of them aimed at trephining at the limbus to establish communication between the anterior chamber and the subconjunctival space as did Elliot later. Lagrange's incision differs from Herbert's in that it is angular in shape, the tip of the 30 degree angle being about 5 mm. above the upper limbus. (Fig. 3.) When completed, the scleral lip

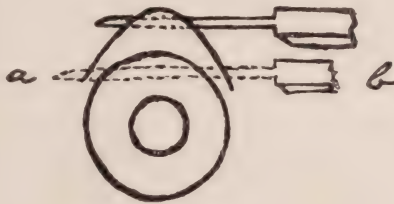


Fig. 3.

is turned forward, separated from the conjunctiva and a small piece excised with a curved scissors; after which the iridectomy is done. That this operation is efficacious is freely admitted by all discerning ophthalmic surgeons, but the large opening in the cornea made by the incision favors somewhat intraocular and even expulsive choroidal hemorrhage—that "bete noir" of even the most cautious eye surgeon. Moreover, it shares with all other filtration operations the opprobrium of late infection with all its dire results.

To obviate the dangers of the large corneal incision and at the same time remove a small piece of the sclera, Elliot devised his now famous trephine operation which virtually taps the anterior chamber and drains off the aqueous permanently through the subconjunctival space. His procedure is too well known to require any description. The commonest feature in connection with it is the almost invariable "quiet iritis" that appears three to five days after the operation. This is probably due to a biologic change in the character of the aqueous humor, perhaps altering its albuminous content. At all events it does occur in a large majority of cases and must be set down as one of the disadvantages of the operation. No one has yet assured us, however,

that a quiet iritis does not supervene after any filtration operation. It is our own feeling that this is likely, as we have seen it after the Lagrange operation, after the Herbert operation and for that matter after the simplest and most beautifully performed iridectomy. Two other objections have been laid up against the trephine operation. First, that it is in some cases "too much of an operation," as Frank Todd has aptly said. Second, that it seems rather disposed to run later into a late infection. In forty cases of trephining which I have done in the last five years, I have had two late infections, and I am bound to say that this has greatly shaken my confidence not only in trephining but in all filtration operations. The Elliot operation, when smoothly done, seems to me an ideal operation in properly selected cases, and were it not for the risk of late infection I believe I would elect it in all suitable cases. In blind eyes there is no superior operation, as it does effectually and seemingly permanently reduce the tension. Indeed, at times it produces what seems like an excessive hypotony, and it is for this very reason that I would elect Herbert's operation or Frank Todd's leech-bite incision in certain cases of simple glaucoma without much rise of tension.

Holth's punch operation also has come under the ban because of recent reports of late infections. Lastly, Lyder Borthen has brought forward iridotaxis or deliberate incarceration of the iris as the method of choice. While we frankly admit our fear that this method is by the logic that follows all scar or incarceration methods most likely to lead to late infection, we have recently resorted to the method in an acute inflammatory glaucoma. After two months the result in one eye has been thus far ideal. In the other eye, the cystoid cicatrix is very prominent and we entertain lively fears for the eventual safety of that eye.

The progress of the filtration operation from DeWecker's anterior sclerotomy to Borthen's iridotaxis has been a more or less logical search for a method that will ensure filtration without the nightmare of late infection. Let us be frank and admit that this is the spectre that hovers over every filtration operation. The following recital of the late infections reported during 1914 as occurring after the various above-mentioned filtration operations should make us wary about per-

forming any filtration operation on any glaucomic eye that is not sightless.*

G. Ford has collected and discussed the records of twelve cases of late infection which followed trephining and of two which followed Lagrange operations. He adds one of his own after the former procedure and considers that such reports make no case for the abandonment of the new methods, but that they possibly suggest the desirability of doing an iridectomy first and watching the result. Herbert quotes Pike's case of infection seven months and Percival's thirteen months after trephining. *Constantinescu*, *Clegg* and *Griffith* report late infections after successful trephinings. These occurred, respectively, four months, thirteen months and two years after the original operations. *Wood* has seen two cases which started at the margin of the flap. In *Wessely's* and in *Cramer's* cases (which started, respectively, three and six months after the trephining) the cause of the complication could not be discovered; the latter did well after a second trephining. *Quackenboss* saw one late infection in 100 cases of trephining. It began five months after the operation in an acute attack of catarrh and ended in phthisis bulbi. He thinks that if time adds to the number of these cases, it will be a serious drawback to the operation. *Morax* and *Fourriere* record two cases of late infection. One beginning seven months after a Lagrange operation was pneumococcal in origin; the other occurred twenty months after a trephining. They consider that in the presence of a condition as serious as glaucoma we may be thankful to have the means of arresting the disease, and must take the risk of infection passing from without into the interior of the eye (the subconjunctival fistulette). *Knapp* records two late infections. In one of them an iridectomy was made first, and later a trephine was used. The end result was good. In the other the infection followed an injury two years after a Lagrange operation; the scar became obliterated but a trephining secured a good result. *Herbert* mentions three cases in his own practice, one occurred in India and followed a conjunctiva-infolding operation. The remaining two followed wedge sclerotomies done in England one year and four years after the operations. In both the latter the eyes recovered with damaged sight. He also refers to two other cases he met with in India, in which late infection attacked eyes with cystoid scars. *Butler* records a case

*Ophthalmic Year Book for 1914.

"which was perhaps one of late infection," six months after a Holth operation. A wasp sting of the lid complicated the course of the case; the interest of this lies in the fact that injuries have been mentioned as preceding some of the late infections which have been reported as following other operative procedures. *Greene* had a case of late infection following a Holth operation; it resulted in the destruction of the eye. *Marshall* mentions the case of a lady operated on by iridectomy for chronic glaucoma, with a good result and with a cystoid scar. A year later conjunctival catarrh developed and the eye was lost from iridocyclitis. *Jaeger* has operated on 255 eyes by Schlosser's operation of combined sclerotomy and iridencleisis, and in five of them he observed attacks of iritis or of cyclitis at varying periods after operation. *Stoewer* reports a case in which a Lagrange operation had been followed by trephining, and ten months after the latter operation late infection occurred. Under active treatment including paracentesis of the cornea, recovery with restoration of previously existing vision occurred.

Constantinescu suggests sinus infections as responsible for some of these cases. *Sattler* believes that faulty technic will prove to be largely responsible. *Ballantyne* blames thin-walled cystoid scars. *Morax* and *Fourriere* agree with them in blaming this form of cicatrix as unsound. *Meller* thinks that iris impaction in the wound predisposes the eye to late infection. *Parsons* is surprised that the record of late infections is not larger, and endorses *Elliot's* recommendations that large flaps should be used, and that the trephine wound should be made far forward in the cornea.

Lagrange, *Gifford*, *Sattler*, *Constantinescu* and *Elliot* lay stress on the necessity to cut the flap thick, and especially so at its base. The last-named considers that cystoid filtering scars are a product of faulty technic and are to be sedulously avoided. He protests against the tendency, which has appeared in some quarters, to speak of late infections as if they were peculiar to trephine operations, and points out that they have been observed to follow all the sclerotomies and sclerectomies, as well as iridectomies and cataract extractions. He in no way minimizes the seriousness of the danger, but reminds his readers that in taking account of the late infections following trephining, it is necessary to bear in mind the enormous number of trephine operations which have been done during the last few years, the publicity which has been ac-

corded the procedure and the seriousness of the condition for which the operation is undertaken. He contends that only by so doing can we keep a true sense of perspective. *Herbert* has suggested that we should aim at forming a filtering scar, and not a fistula, with a view to lessening the dangers of late infection. *Elliot* replies that there is no anatomical evidence that a filtering scar, in the sense used by *Herbert*, has any existence in fact, and that it is a conception opposed to all the teachings of pathology. *Gifford*, *Elliot* and others advise that *the hygiene of a trephined eye should be carefully watched for the rest of the patient's life.*

This last sentence of the quotation sums up the whole matter. Patients on whom filtration operations have been done should be warned that such eyes will have to be under some manner of treatment or observation the rest of their lives. That on the appearance of the slightest redness or congestion they should report at once to the surgeon lest the eye be jeopardized or even lost. To paraphrase *Ecclesiastics*: "To do a filtration operation *may* be wisdom, but to watch such an eye forever afterward is certainly understanding."

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CLASSIFICATION OF GLAUCOMA.

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IN general it is commonly held that glaucoma represents a condition, the essential symptom of which is an increase of intraocular tension.

The experimental manometer researches of Schiotz (1905) led him to conclude that the normal intraocular tension lay between 12 mm. and 27 mm. of mercury, and for comparative purposes his tonometric instrument has added precision to the records of tension and furnished a method of registering the effects of remedial measures.

That this instrument still leaves much to be desired is generally acknowledged, since if 12 mm. Hg. can be normal then 27 mm. Hg. can certainly be glaucomatous for some eyes.

In some forms of glaucoma it is affirmed that tension may be normal. Dr. William McLean has conducted experiments showing the manometer pressure in the eyeball to be from (see article in this issue) 22 mm. to 40 mm. Hg., and he has constructed a superior tonometer (Meyrowitz) for its measurement.

The etiological factor in glaucoma is still unknown, and since a classification must be based upon something which will meet the clinical manifestation, most authorities while mentioning those of others accept the theories of Priestly Smith, who concludes that it is due to an interference with the outflow of the intraocular fluids through the filtration spaces at the angle of the anterior chamber, and his own definition is "An excess of pressure within the eye, plus the causes and consequences of that excess." His measurements show the glaucomatous eye to be as a rule smaller than normal, and the crystalline lens to continue to grow after adult life. At the age of 65 years it is one-third larger than at 25.

A large lens, then, in a small eye leaves a narrow space between it and the ciliary body.

Prior to Priestly Smith the cause of glaucoma was proclaimed by Leber to lay in the obstruction of the angle of the anterior chamber,

and his researches were amply corroborated by Knies and Weber—and these conclusions are universally accepted.

Accepting the conclusions of Leber, Knies, and Weber, the varieties of glaucoma are primary and secondary.

Primary when it does not appear to be caused by any previous fundamental disease of the eye.

Secondary when it occurs as a sequel of pre-existing disease or conditions of the eye.

The *primary variety* is a common disease of the eye and constitutes about one per cent. of all cases.

In a purely artificial classification it is divided into (1) *simple glaucoma*, which runs a non-congestive, non-inflammatory course; (2) *subacute*, the course of which is marked by chronic congestion, and (3) *acute congestive* ("inflammatory").

These terms represent the same morbid process, being but convenient clinical distinctions, for acute glaucoma may subside or lose its marked signs of congestion and pass over into chronic congestion, and likewise simple glaucoma may at any stage develop congestive symptoms and become and terminate in the manner of the acute form.

It was Hirschberg who reported a simple glaucoma under observation for twenty years which suddenly became acute and necessitated an enucleation.

In an effort to emphasize this, Priestly Smith taught that the term "Primary" really means "without antecedents," and that acute and chronic glaucoma are essentially of a like nature, each depending primarily on an obstruction of Fontana's spaces,—rapidly in the acute and slowly in the chronic clinical type.

Glaucoma occurs mostly in persons past forty years of age (88 per cent.) when the lens is relatively large, and it is most frequent in the hyperopic or small eye. It has occurred in cases of aniridia and is not rare after cataract extraction. Both of these conditions are explained by an obstruction of the filtration angle.

Stellwag believes that obstruction to the circulation by narrowing of the canals in the sclera for the passage of the vena vorticosa, apt to occur with age, is a potent factor.

Abadie and Thomas Henderson contend that an irritation of the sympathetic nervous system controlling the vasomotor nerves of the eye increases the intraocular secretion. Other observers hold that a

low form of uveal disease is responsible for some cases classed as simple glaucoma.

Stronkowsky and Zentmayer contend that the causative factor is an indurative scleritis affecting the anterior segment of the eye.

Fish, J. I. Dowling, and others state that glaucoma appears in connection with diseases of the nasal accessory sinuses and that marked relief and even a cure has followed suitable surgical measures directed to the drainage of these cavities.

In order to satisfactorily explain the phenomena of glaucoma it seems necessary to recognize three factors; (1) the vasomotor nervous system, which in the presence of faulty conditions of the blood-vessels and over-exertion may in favorable cases increase the intraocular secretion; (2) a change in the character of the aqueous humor (its colloid nature as stated by Troncoso) preventing its free passage into the lymph channels, and (3) a narrowing of the channels of outflow.

Simple chronic glaucoma has its onset in persons seldom under fifty years of age and obtains a fair start before its first symptoms are observed—at least this is commonly the case; and likewise the early suggestive symptoms are usually overlooked by the patient, to be disclosed only by the careful later questioning of the oculist who is finally consulted.

These early signs consist in temporary brief periods of hazy vision with a "rainbow" effect, or "showers," or bright dancing zig-zag lights about a darkened area. Frequently there will be a headache or slight sensation of nausea, and they present themselves at a time of mental anxiety, grief, business troubles, or periods of nervous exhaustion and depression. These signs are very slight, the progress quite slow, and quite free from any considerable exacerbation or remission. One eye, being commonly more affected than its fellow, may become quite amblyopic when first presented for examination.

The external signs are not such as to attract attention. The anterior ciliary vessels are slightly enlarged; one or both pupils may be slightly enlarged.

Only seldom is the cornea hazy or the depth of the anterior chambers shallowed. The tonometric tension is usually increased, and may vary at different times of the day or from time to time. Gradually these symptoms increase and with rising tension of the globe the optic disk becomes cupped and the vision fails. Cupping of the disk may

occur with a tension well under the upper range of what is called normal.

With all of this there may be entire freedom from pain, and vision normal with corrected refraction. The fields of vision are valuable, but they may remain normal even after there is a marked excavation of the optic disk. Usually they are peripherally contracted, increasing with the progress of the disease. The color fields correspond with this contraction. An early typical sign is contraction of the nasal field and a scotoma continuous (Bjerrum) with the blind spot. Ultimately all these signs increase till the eye is blind and of stony hardness.

Subacute or chronic congestive *glaucoma* is like the simple form but characterized by occasional semi-acute signs, being prone to intermittency. Being months apart at first, they become more frequent and the severity of the symptoms increase. Between attacks the eye is never quite so near normal as before. A heavy temporal headache is common. Presently the eye is persistently congested, showing a steamy cornea, sclera discolored, ciliary vessels engorged, iris dilated, grayish lens, cupped disk, recurring pain, greater elevation of tension, and in the course of months or years, total blindness supervenes.

Acute congestive or inflammatory *glaucoma* has a prodromal stage, when besides the early signs as in simple glaucoma, together with rapidly developing diminution of the range of accommodation there will be frequent changes in refraction demanding stronger reading glasses. Commonly the trouble follows an illness, or emotion, anxiety, undue exertion, or follows after too hearty eating.

The acute attack is sudden, with vague frontal or temporal headache, obscured vision, nausea and vomiting which the patient usually ascribes to "biliousness." However marked the symptoms, with redness of the conjunctiva, chemosis, dilated pupil, and dim vision, all symptoms may subside and the eye remain normal for some days or weeks; but similar attacks recur from time to time over a period of months, perhaps even years, till finally the acute attack comes.

Then there is pain, increasing hourly in the head and face, nausea, vomiting, flushed face and fever, or prostration and depression may be marked. Vision is greatly reduced, lids edematous, conjunctiva chemosed, cornea steamy and anesthetic, marked photophobia, pupil dilated and immobile, aqueous turbid and iris apparently discolored.

The anterior chamber will be very shallow, the tension very high, 70, 80 or even 100 mm. Hg. Vision is greatly reduced, or wholly lost. Both eyes may be affected or one follow the other in a few hours, days, weeks or years. After lasting from several days to several weeks this acute attack will subside; there will be a partial return of vision, the tension will fall and the iris will recover some mobility. The field of vision will have narrower limits, particularly on the nasal side, and the pupil will be somewhat larger than normal.

During the attack the opaque media will prevent an observation of the fundus, but as it subsides the ophthalmoscope will afford a view which may show only moderate changes. These changes will vary with the length of the attack.

Cupping of the disk may be only slight, the arteries may show a slight pulsation—or if not a little finger-pressure will produce it, and the veins will probably be engorged. After a period of time which may run into months other attacks will supervene, each to be followed by a lesser return to normal, till the glaucomatous picture is complete, when the pupil will be wide and fixed, the iris discolored, the lens a grayish green, cornea hazy, anterior chamber shallow, vision destroyed, and new blood vessels will appear in the cornea and sclera.

Ultimately the lens will become cataractous, the cornea may ulcerate and perforate, and the whole eye become disorganized and atrophic. Rarely this whole process may result from one violent attack of but a few hours' duration, being called *Glaucoma fulminans*.

Secondary glaucoma is a term employed to cover an increase in tension of the globe consequent upon an antecedent pathological condition of the eye. This increase may be slight, intermittent, temporary or most acute, and will present all the obvious signs and consequences of primary glaucoma if unchecked.

In almost all cases there is a definite obstruction to outflow of aqueous humor.

The usefulness of a part of the filtration angle may be lost by anterior synechia following wounds and ulcers of the cornea, scleritis, episcleritis, anterior uveitis, gumma, plastic iritis, annular posterior synechia, dislocation of the lens, swelling of an injured lens, cataract, needling operation, choroidal tumor, choroidal and retinal hemorrhage.

In some of these cases the remaining useful portion of the filtra-

tion angle is not sufficient for the outflow. In others the aqueous humor contains insoluble material which blocks the spaces.

Buphthalmus, congenital juvenile glaucoma, is a disease of childhood generally present in both eyes but most pronounced in one. Investigators (Lohlein, Hamburger, Boehm, Zentmayer and Gilbert) have shown that the canal of Schlemm is absent or rudimentary in the majority of cases. Therefore, the escape of intraocular fluids is restricted. The youthful sclera being firm the eyeball enlarges, particularly in its anterior portion, and especially that portion just anterior to the ciliary body and iris. Therefore, the anterior chamber is deep. The cornea is large. The lens does not increase in size, but is relatively small with an increasing space between it and the ciliary processes. An axial myopia is produced by the increased length of the anterior portion of the eye.

Usually the first eye affected will be most buphthalmic while the second one developing later will find the sclera more firm and this eye will present juvenile glaucoma with deep anterior chamber and myopia, but with a smaller cornea.

In time the compressed ciliary processes cease to functionate and the eye remaining large will become soft.

Eirschberg has seen juvenile glaucoma and buphthalmus associated in the two eyes of the same patient, and the writer wishes to report a similar case.

This child of seven years has a buphthalmic right eye with a tension of 3 mm. Hg., while the left eye has juvenile glaucoma, the cornea but slightly enlarged, deep anterior chamber, tension of 60 mm. Hg., cupped disk and myopia, vision fingers at three feet. With a corneo-scleral trephine this eye now counts fingers at twelve feet and reads the time on a watch.

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THEORIES OF GLAUCOMA CAUSATION.

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THE following is a review of the important hypotheses and theories resulting from the study of glaucoma from its first observation up to the present time. These may be somewhat loosely grouped into the Retention, the Secretory, and the Chemical theories.

Von Graefe the father of iridectomy for the relief of glaucoma, attributed the disease to serous choroiditis. This produced an increase in the vitreous chamber thereby raising the tension of the globe, and compressing the retina. Alt and Sattler agreed with him, but later considered this choroiditis to be due to irritation to secretory nerves.

Leber, 1876, held that the supply of fluids in the chamber of the eye was by transudation from the capillaries of the ciliary body through the medium of epithelium over the processes, both vitreous and aqueous containing 1 per cent. saline with extractives and albumen in 95 per cent. water. This newly secreted fluid nourished the vitreous, and supplied the aqueous by osmosis. Its secretion was regulated by the relation of blood and aqueous pressure. The fluid reached the aqueous chambers though the diaphragm about the lens, thence by filtration and diffusion through the pectinate ligament, next by filtration into the canal of Schlemm and into the anterior ciliary veins. The iris when functioning drained some fluid, and a small amount carried off by the lymph channels about the optic nerve.

Schoenberg says that in ocular drainage slow rate means latent glaucoma, or predisposition to acute attack or chronic glaucoma: while rapid drainage tends to a state of compensation.

Experiments are reported as showing that irritation of cervical sympathetic increases and that section of nerve decreases ocular pressure.

Parsons thinks that stimulation of cervical sympathetic causes rise of intra-ocular pressure by contraction of unstriped muscle fibres in the orbit, rather than through alteration of general blood pressure:

that the control of intra-ocular fluids by the nervous system is very indirect.

Priestly Smith explains how an insufficient circumlental space found in small eyes or where large lenses exist predisposes to high tension. Turgescence of the ciliary body for any reason means more fluid in the globe; the high tension is compensated by the ready escape of aqueous, thereby rendering the anterior chamber shallow, and the diaphragm is then carried forward and blocks the angle, the ultimate result being high tension. Hypermetropes and people of 50 to 60 years with sclerosed lenses, he contends, are the most frequent victims of glaucoma *** the possible causes as we have seen are many and it is likely that every cause is sometimes the actual cause."

Knies gave a different opinion concerning the nutritive fluids. He found their secretion from the choroid, ciliary body and iris. From the chorir-capillaris the fluids pass through the retina into the vitreous and are carried forward, part being taken into the lens at its equator, but a greater portion passing through the suspensory ligament. Aqueous is secreted by the anterior surface of the ciliary body and iris. Fluids leave the globe through the iritic angle. *Knies* and *Weber* demonstrated that in eyes blinded by glaucoma, the drainage angle of *Leber* was obstructed by adhesions of the iritic base to the adjacent cornea, and that increased pressure was due to obstructed outflow rather than to increased secretion.

Hess studied the relation of size and position of the ciliary body and concluded that the drainage angle is often impinged upon by it. *Baily* observed chronic inflammation in ciliary bodies with distension of vessels, and considered it the primary lesion. *Laquer* believes that a rigid sclerotic retards the lymph flow. *Stilling* thought that sclerosis of sclera at the papilla interfered with lymph outflow to the extent of glaucoma.

Wahlfors claims the primary lesion to be in the chorio-capillaris, and that nutritional disturbances of rod and cone layers explain the cupping of the disc and visual reduction. Further that deposits occur in exit channels by virtue of retarded flow following paralysis of choroid muscle structures, which in turn causes stasis and an increase

of pressure by interference with the caliber of otherwise patent venæ vorticosaë.

Knies later mentions disease of the optic nerve as causative. Donders thinks innervational disturbance with hyper-secretion and uncompensated outflow produces glaucoma. Other men have thought that optic neuritis brought about a lymph stasis and increased tension. These have been referred to as Posterior Glaucoma.

Zimmerman thinks a difference between the general blood pressure and ocular blood pressure is a primary cause. *Elliot* (*Sclero-corneal Trephining*, Ed. 2, p. 127) reports the results of investigation into the matter of arterial tension among patients at Madras. It was found that glaucoma patients at the age of forty-eight had higher tension than cataract cases six years older; however this was not constant, and, therefore, regarded as causative only in a large number. Radial or general arterial sclerosis or interstitial nephritic high pressure is not usually associated with high ciliary pressure.

Uribe-Troncoso, of Mexico, found an increase of albumen in aqueous, and offered the hypothesis that tension increase was due to this. However, that albumen resulting from exudations as serous deposits, that pigment from hemorrhage (*Levinsohn*), and that tumor cells (*Verhoff*) may mechanically obstruct filtration, renders this explanation less tenable.

Prince (*Ophthalmoscope*, Jan., 1916) in his discussion of his gold-nude-shoe drain for glaucoma, mentions that *Nicatti* noted codium chloride crystals in aqueous during an operation, and that in the same case after a few minutes fibrin was found in considerable quantity—nature's method of healing the cut cornea.

Thomas Henderson, after extensive work in 1907, announced the hypothesis that glaucoma was due to obstruction and closure of the filtration angle resulting from sclerosis of the "cribriform ligament" (pectinate ligament). This ligament is made of fibres from the posterior and inner corneal tissue and ends in or at the ligament of origin of the ciliary muscle and not terminating in the root of the iris as heretofore thought. Its structure is that of a fibrous parenchyma containing venous spaces probably not unlike the splenic pulp. It is, therefore, acted upon by the ciliary muscle rather than the iris, and in ciliary overuse a sclerosis results in this ligament with consequent reduced filtration. In hypermetropia and presbyopia there is, there-

fore, a predisposition to this sclerosis. He contends further that the ciliary body is dragged forward by the iris and not the latter pushed anteriorward by the ciliary process. This action causes first a reduction and later an obstruction to filtration at the angle, the iris through its crypts caring for practically all the drainage possible in the anterior chamber. He holds that intra-ocular pressure is the result of the index of intra-ocular venous pressure and not of aqueous balance. In congestive glaucomas he thinks there is also a vascular excitation element.

See diagram, page 5443, Volume VII, American Encyclopedia and Dictionary of Ophthalmology. The author (Chance) criticises Henderson by saying that shallowness of the anterior chamber, which is progressive and a further obstruction to the angle, is not thereby explained. And furthermore, since sclerosis of the cribriform ligament is causative, why do not all old eyes and why do so many young eyes develop glaucoma? He concludes that Henderson's theory is really one of retention, and agrees with Verhoff that this ligamentous sclerosis may be the result of iritic adhesion.

Myosis is beneficial then by virtue of the fact that the iris is dragged from its impacted position in the angle against the cornea, thereby opening the angle as well as increasing drainage through the iritic crypts (Henderson) into the veins.

Fisher in 1907 attracted attention by his hypothesis of ocular edema, which he holds is caused by hydrophylic colloids increasing their water content. As a causative factor, in some way, acid is produced within the eye and activates the hydrophylic change. *Ruben* demonstrated the vitreous free of hydrophylic element; that it did not swell by the addition of acid, but that a marked swelling did occur in the cornea and lens. Failing to reduce glaucoma tension by sub-conjunctival injection of sodium citrate for the purpose of re-establishing the osmotic balance, he supported *Fisher* in his premise.

The *modus operandi* of relief in glaucoma from the various operations of von Graefe, deWecker, Herbert, Lagrange, Elliot, and others is not uniformly agreed upon. *Ed. Jackson* says, "The formation of new vessels at the site of operation has much to do with re-establishment of the connection between the interior of the eye and the canal of Schlemm, by the formation of new venous channels of

outflow, which permit the intra-ocular pressure to drop nearer to the venous pressure of the body."

Chance, summing up on causation, says, "The subject is in an unsettled state and, as can be seen, the number of hypotheses advanced for the explanation of the nature and the seat of glaucoma is almost infinite, yet while the lines of inquiry are clearly marked out, no single one of them can explain all causes."

Brown Pusey (De Schweinitz, Text-book) experimented with varying the osmotic intra-ocular pressure, and thought causative factors might be explained along that line.

Stellwag (Fuchs, Text-book) refers the increased tension to an increase of blood content in the intra-ocular vessels, particularly in the uvea. An elevation in blood pressure in these vessels, he thought, was the direct cause of glaucoma, and not increased fluid content.

Fuchs says that glaucoma develops only in eyes predisposed to it. He is of the same opinion as Smith regarding the circumlental space. Increased tension may be set up by the dilatation of the pupil, *i. e.*, psychical excitation or by mydriasis; if the iris remains in the angle sufficient time to become anchored by the exudate from the congested uvea, then tension is permanently high; if adhesion is prevented by myosis or by other means applied, the tension comes down by compensating filtration at the angle.

Donders, *Schnabel* and *Roeder* believed that intra-ocular irritation of secretory nerves lies in the uvea, and is a reflex neurosis. *Hutchinson* and *Schmidt-Rimpler* considered that trifacial neuralgia produced such a reflex. *Moren* thought affection of the brain and medulla might cause the same.

Alt, summing up in the Handbook, failed to see any virtue in the choroiditis theory, but believed that obstruction to outflow of blood and lymph would explain the tension, conceding that many influences might contribute to this obstruction.

Harkness (*Jour. Oph. Otol. and Laryn.*, Dec., 1915) presents the explanation of glaucoma upon conditions of aqueous supply from the vitreous body. He gives a more complete idea of vitreous structure based upon histologic examination, and mentions Salzmann for authority, that vitreous is a highly refractive tissue with many lymph channels pervading it. From the retina as a base of attachment this system of lymphatics converges toward the central lymph canal draining

anteriorwards to the lens. Fuchs (Text. p. 296, Ed. III) gives a scheme of ocular lymph channels showing his hyaloid canal of central drainage. Stillin, Schaff and Brisbach demonstrated this central canal referred to by Harkness. He contends that obstruction at the circumlental space retards or prevents drainage of the vitreous lymph into the aqueous areas, thereby pushing forward the diaphragm and impacting the angle. This latter condition with the shallow anterior chamber is all secondary to circumlental occlusion for, he holds, the injection of fluids into the anterior chamber or massage over the cornea will release the impacted diaphragm and re-establish drainage about the lens; if the filtration angle and Schlemm's canal are not closed by adhesions, etc., the tension will come back to normal. Otherwise operative measures to provide filtration at some point are necessary and upon this theory is to be explained the utility of glaucoma operations.

Dowling (*Homœopathic Eye, Ear and Throat Journal*, Oct., 1910) discussing his experience in treating glaucoma simplex by means of intra-nasal procedures, says, "My researches into the mysteries of glaucoma lead me to the belief that Knies was correct in his statement that there may be a specific glaucoma poison, and I believe that this is the true explanation not alone of congestive glaucoma, but also of glaucoma simplex."

He explains the reasonableness of the retention theories as follows: "I hold that glaucoma may be secondary to some previous disease of the nasal accessory cells or sinuses, and probably most often of the ethmoid cells."

"The various possible causal factors all yield to this reasoning. The nervous element may be explained by the fact that the nasal nerve as it passes out through the ethmoid cells may be irritated, and through its relation to the lenticular ganglion and the long ciliary nerves of the ciliary body (or secreting portion of the ocular media) may be so influenced that its function is perverted. Vasomotor disturbances may ensue and congestion of the uveal tract is a consequence. Furthermore, the ocular media are altered from their natural crystalloid state and through albuminous changes they become colloid in nature, thereby hindering the normal outflow by way of Fontana's spaces and Schlemm's canal, and the possible osmosis through the venous channels is impaired. Hence, through a combination of factors retention of secretion follows, and the symptoms are all further increased by the gradual ap-

position of the iris over the ligamentum pectinatum with obstruction of Fontana's spaces.

"Knies' theory of a 'specific glaucoma poison' may be explained through the theory of positive infection, which idea I now submit as an original corollary in explanation of Knies' theory, first advanced in 1890.

"The method by which this ensues may result from streptococcic, staphylococcic or other infection of the ethmoid cells or nasal accessory sinuses, which having become infected act as natural laboratories in which the germs multiply and develop toxins which may be conveyed by way of vascular or lymph channels to the uveal tract and so occasion the change from crystalloid to the colloid state, this change being the sine qua non of glaucoma.

"Providing that this theory is true, then the relief of glaucoma symptoms should ensue upon appropriate intra-nasal treatment or surgical interference."

Writing recently (*Journ. Oph., Otol, and Laryng.*, Feb., 1916), he says further, "Continued study and more recent clinical observations have led me to the belief that intra-ocular changes and increased tension, in at least a fair proportion of cases, are secondary to extra-ocular pressure, and that the colloid changes are induced by circulating toxins originating in infected ethmoid cells or other accessory nasal sinuses."

This writer has reported under various headings a remarkable lot of cases which demonstrate the relation of intra-nasal and intra-ocular conditions. His "argyrol tamponade" plays a great part in all these citations.

Whether acute glaucoma and glaucoma simplex are similar conditions or separate entities, may further be profitably studied. There seems to be great virtue in the colloid theories. The writer suggests investigation into the physical and chemical analysis of normal and glaucomatous aqueous and vitreous with the idea of substantiating the colloidal theory.

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VISUAL FIELDS IN GLAUCOMA.

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THERE are few diseases of the eye which commence more insidiously and terminate more disastrously than glaucoma. The early recognition of the disease is often difficult, but of great importance, and reliable tests for determining its progress are essential for therapeutic efficiency. Visual field tests rank high as aids to early diagnosis, and if these tests are skilfully made and accurately recorded they usually become the best guides as to the progress of the disease. Visual field records to be of value in such a serious disease as glaucoma must be made with appropriate instruments and by exact methods. It is work which if it is worth doing at all is worth doing well. Before passing to a description of the various visual field defects in this disease it will be of advantage to consider briefly the instruments and methods which I deem essential for the complete detection and recording of these defects.

INSTRUMENTS.*

Three instruments are quite important. A good perimeter, a stereoscope and a Bjerrum screen or some form of a campimeter.

1. Perimeters are best adapted for taking the form and color fields, except when they are contracted to within 10° of the fixation point. With a good perimeter (there are many poor ones) large and medium scotomata beyond 5° from the center can be outlined, and the blind spot fairly well determined, but not as satisfactorily as with a Bjerrum screen.

2. A stereoscope and Haitz cards are particularly adapted for measuring very contracted fields, especially if the patient has binocular vision. Small central or paracentral defects within 10° of the center can accurately and more easily be determined than by any other instrument. A 1 to 3 mm. test object mounted on a very slender carrier should be employed. I have added to Dr. Haitz's cards one which is

*A much fuller description of perimetric instruments, methods and experiments will be published by the author in a later issue of the JOURNAL.

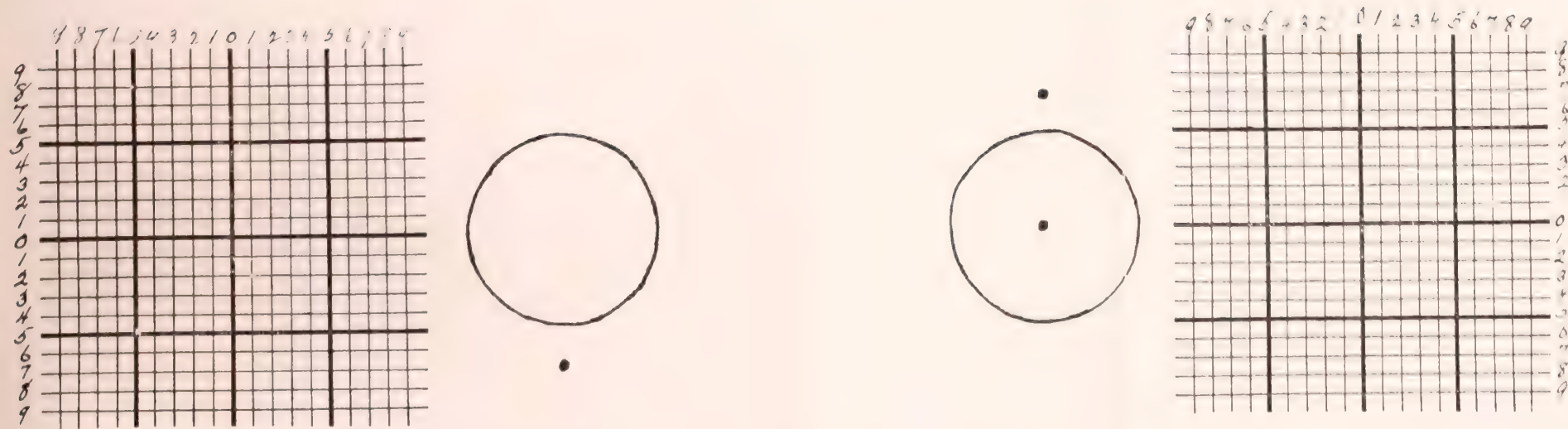


Fig. 1. Author's stereoscopic blind spot card

about three inches longer than his, and this card is marked in 3 mm. squares toward each end so that the area of the blind spot may be quickly and correctly estimated. It is desirable to have for this test a stereoscope with about a $+4$. combined with a 9° prism in a revolving cell before each eye. The ordinary stereoscope found in the store has

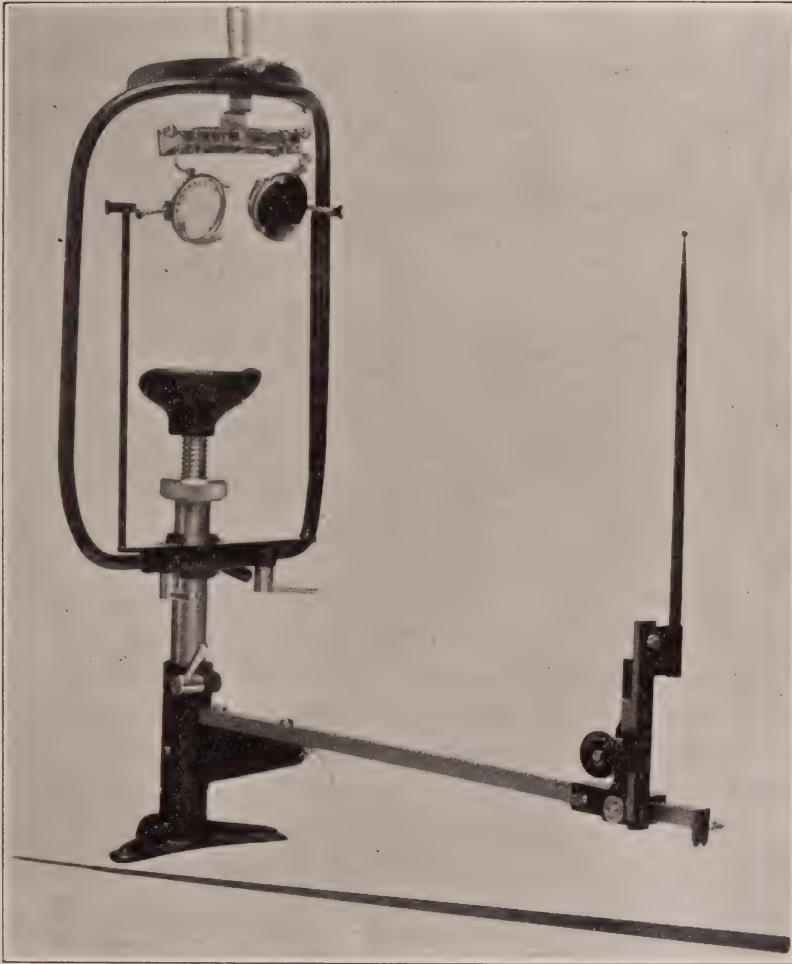


FIG. II.
Author's two point alignment instrument.

about a $+3$. combined with an 8° prism, and this does not bring the blind spot entirely into the field of the instrument.

3. The Bjerrum screen is the best instrument for measuring the

blind spot and all scotomata between 5° and 25° of the fixation point. It is the least fatiguing method, the most accurate and the plotting of the defects can be on a scale of sufficient dimensions for satisfactory comparison. One of the great difficulties in all visual field testing is for the patient to maintain central fixation. Binocular vision in the Haitz test helps to secure this. The complementary color method of Herschberg and Schlosser and Dr. Walker's macula selector allow central binocular vision on the Bjerrum screen, but these are often inapplicable. To aid in maintaining fixation with one eye I have had the Bausch & Lomb Optical Company make what I call a two point alignment instrument. With it a very high degree of accuracy is possible and the measurements can be made rapidly and with less ocular fatigue than usually attends exact perimetric testing.

METHODS.

1. *Light.* Bright daylight, preferably a north light, is best in visual field testing in glaucoma. In no other disease in which visual field defects occur is it more important to consider the quality and quantity of the light and to record for future reference the light conditions under which the test was made.

2. *Color and size of test object.* The color of the test object should be quickly changeable without the knowledge of the patient. The experiments of Bjerrum, Van der Hoeve, Ronne, Seidel and Walker clearly show that especially in glaucoma it is desirable to examine the field with test objects of different sizes. By so doing very early and slight defects may be discovered.

3. *Records.* If visual field tests are to be utilized in determining the progress of the disease very accurate records must be made. The form and color fields can be easily recorded by the self registering perimeter and kept for future reference. I have had charts (see Fig. 3) printed upon which to record the Haitz test, and also the full size of the blind spot measurements made with my stereoscopic blind spot card. I also keep a full-size record of the Bjerrum screen tests and find this much more satisfactory than any attempt at reduction. On all three kinds of records I have the following data printed.

VISUAL FIELDS IN GLAUCOMA.

1. Contour of Face { Normal
Unusual
2. Size of Pupil (in position for test)
3. Plane of Iris. { Back
Normal
Forward
4. Mental Re-action { Quick
Medium
Slow
5. Method of Signal { Voice
Light
Bell
Finger
6. Daylight }
Artificial Light . } . . { Bright
Medium
Dull
7. Size of Test Object . . . { Form Field
Color Field
Scotoma
Blind Spot
8. Direction of Test Object { Visible to not Visible (V. to N. V.)
Not Visible to Visible (N. V. to V.)
9. Refraction { Corrected (C. R.)
Uncorrected (Uc. R.)

VISUAL FIELD DEFECTS.

The visual fields should be taken in every case of suspected glaucoma. In acute glaucoma the vision may be so reduced that perimetric tests are impossible, and in simple glaucoma the disease may be so far advanced that they will be of very little diagnostic significance. Nevertheless, accurate records should be secured if possible, as they may become of greatest importance in determining the progress of the disease, or the value of therapeutic measures. The central vision, the tension and the cupping may seem to remain stationary, but the area of the field defects may continue to increase. Under such circumstances the value of frequent and careful plotting of the fields is apparent, and such information may be the determining factor in deciding for or against surgical interference. If this is true, too much emphasis cannot be laid upon the importance of striving for a high degree of accuracy in making and recording the tests. It is often interesting to observe the favorable changes in the fields after reducing the tension by myotics or an operation.

In beginning glaucoma with normal central vision, doubtful cupping and tension not above 25 mm. Hg., the field tests may be essen-

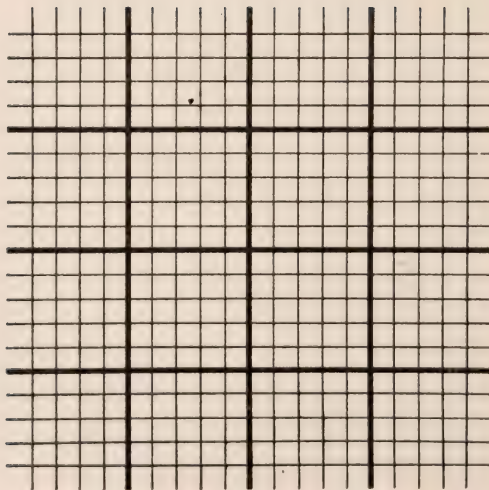
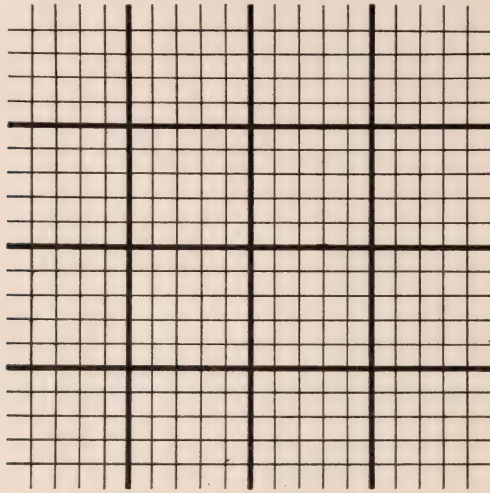


FIGURE III.
Author's Chart for Recording Haitz Tests and Author's Steroscopic Blind Spot Measurements.

tial to complete the diagnosis. Such cases may have only asthenopic symptoms and diminished accommodation. Bjerrum goes so far as to

say that a normal blind spot excludes glaucoma. This may be a somewhat over statement, but the longer I work with suitable instruments and scientific methods I am convinced that his statement is much nearer the truth than is commonly supposed. Normally, the size of the blind spot will be the same whether tested with a 3 mm. or 10 mm. test-object, but in glaucoma in the early stages the blind spot may be normal with a 10 mm., but considerably enlarged with a 3 mm. test-object. This is of great diagnostic importance. Small paracentral scotoma may be discovered near the blind spot and often merging into it. Seidel has especially called attention to very small scotoma which can only be detected by using a small visual angle test-object. He worked with a Bjerrum screen, but the author's stereoscopic blind spot card (see Fig. 1) and a test object of 1 to 2 mm. are well adapted for discovering these small scotomata. Probably the cause of these defects is due to the beginning stretching of the optic nerve fibres as they come over the edge of the disc. As the disease progresses the blind spot enlarges for even a 5 or $7\frac{1}{2}$ mm. test-object and a sector-like defect may appear in the temporal field. Bjerrum and Ronne have described a "bow-shaped" defect from the blind spot and bending around the fixation point. It seems to correspond to the course of the arched retinal fibres. There is a chance for some interesting speculation as to the cause of the enlarged blind spot and the early appearance of small scotomata. Dr. Dowling has suggested the possible relationship between sinus disease and glaucoma. It is a well established fact that sinus disease can cause enlargement of the blind spot and small central or paracentral scotomata. Does the similarity in the field defects in those two diseases argue in favor of a causal relationship? In sinus disease I have noticed color scotoma more often than in glaucoma. Focal infections at the teeth, tonsils, intestines, etc., often develop toxins which seem to have an affinity for the optic nerve fibers, and scotomata and enlarged blind spots are not uncommon. Could there be a toxin for glaucoma which first influences the optic nerve fibers causing the field defects and later brings on changes within the eyes resulting in increased tension?

The blind spot may be enlarged in myopia, and I have some interesting charts to show that the enlargement is a very fair test of the progress of the myopia. About 20 per cent. of the cases of simple glaucoma are myopic. This fact must be kept in mind or undue im-

portance might be given to an enlarged blind spot in a myopic patient with suspected glaucoma. Contraction of the form-field either begins shortly after changes in the region of the blind spot or is coincident with them. The contraction increases with the progress of the disease. It is usually less regular in outline than in atrophy of the optic nerve. Sector-like indentations are common both in the temporal and nasal field. A "nasal step" I have noted several times. This may also occur in tabetic atrophy. It is often surprising in glaucoma how contracted the field may become and the central vision remain nearly normal. Color fields are less early influenced than in atrophy. Green and red are more affected than blue. It will be noticed that reduced illumination influences the color field more than in a normal state and colored test objects of large size may be required for securing satisfactory measurements. In conclusion, I would again emphasize three points:

1. Equip with suitable instruments.
2. Keep accurate records.
3. In suspected cases search for small paracentral scotomata and outline the blind spot with both large and small test objects.

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TONOMETERS, AND THEIR USE IN THE DIAGNOSIS OF GLAUCOMA.

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IT has been said that "Any instrument which enables a clinician to obtain a more accurate knowledge of the disease he is called upon to treat is a welcome addition to his armamentarium." Especially true is this in the diagnosis and treatment of glaucoma.

As far back as the days of Hippocrates, the condition which we now classify under the broad term of glaucoma was considered one of the most dreadful calamities that could befall an individual, yet it was not until 1830 that Mackenzie observed that a hardness of the eyeball occurred in glaucoma.

The importance of the correct conception of the intra-ocular pressure has been admitted since the full force of Mackenzie's discovery became manifest, and we find in looking over the history of Ophthalmology, that investigators early appreciated the inaccuracy of the estimation of intra-ocular pressure by the digital method.

The manometer, in actual connection with the interior of the eye and with a perfect technique, is the only method known to-day of obtaining absolutely accurate conceptions of the intra-ocular pressure. Ophthalmo-manometry was founded by C. Weber in 1850, but ophthalmo-manometry is not applicable for general use in determining intra-ocular pressure as it endangers the function of the eyes, in consequence of which many instruments have been devised for estimating the intra-ocular pressure.

Two types of instruments have been devised. One called the impression type, that which records the amount of indentation or dimpling by a given pressure, and the applanation type, that which records the amount of flattening of the eyeball to a given pressure.

The word tonometer has been the term chosen to designate an instrument for estimating the intra-ocular pressure, but tonometer is not a well chosen word as intra-ocular pressure and eye-tonus are not one and the same.

As early as 1863 von Graefe constructed a tonometer which was of the impression type. At the same time and independently of von Graefe, Hamer under the direction of Prof. Donders constructed an impression tonometer which was designed to be placed directly on the eyeball. Readings with the von Graefe and Hamer tonometers were obtained by pressing the instrument with the hand against the eye under measurement. Dor recognized the unreliability of any method which employed the hand to produce the pressure, and proposed that a tonometer should be suspended by a string and allowed to work on the eye by its own weight. Impression tonometers were also made by Donders, Monnik, Lazerat, Priestly Smith, Snellen, Hembold and others.

The Hembold instrument was constructed to determine the intra-ocular pressure of the two eyes of an individual at the same time.

The tonometers of Fick and Maklakoff are good examples of the applanation type. The Fick tonometer was constructed on the principle of a spring lever pressing against a flat plate of a definite area, applied over the sclera, and noting the tension necessary to produce a flattening of the sclera equal to the area of the plate. In this instrument the hand is the source of energy for the spring. Ostwalt and Koster made some minor modifications of the Fick tonometer but retained the general principle of that instrument. The Makalkoff tonometer differed from those already mentioned and was designed to be placed on the uncovered cornea, and rested on the eye by its own weight. The instrument consisted essentially of a weight which had on its contact surface a flat disc of polished glass 1 cm. in diameter. When the instrument is to be used a smear of coloring solution is applied to the free surface of the glass, and the instrument allowed to rest momentarily on the cornea. Contact with the cornea presses the coloring solution out, and thus a ring of solution is formed, the inside clear area of which is equal to the area of flattened cornea. A transfer is immediately made on prepared paper from which the intra-ocular pressure is computed. Of the many tonometers brought out up to the time of the Schiotz instrument, the Maklakoff was perhaps the best suited for general use.

In 1905 Professor Schiotz published his experiments and brought forth a new tonometer which bears his name. Later the Schiotz tonometer was copied by Harry S. Gradle, a few modifications being made.

Both of these instruments require a chart, on which a translation of the excursions of the indicating needle is made into millimeters of manometer pressure. Different weights are employed according to the degree of hardness of the eyeball. I have observed in both these tonometers that the plunger is so close to the footplate barrel, that fluid remaining on the cornea at the time of making a reading may be sucked up into the instrument by capillary attraction and the accuracy of the reading impaired. Paul Knapp, of Switzerland, observed this same possibility of error due to capillary attraction.

The readings of the Schiotz and Gradle instruments are supposed to indicate the correct intra-ocular pressure according to the manometer.

The manometer in actual connection with the interior of the eye is the only way of obtaining absolutely accurate conceptions of the intra-ocular pressure, and even with that method errors in technic easily creep in and nullify the readings. Only recently Priestly Smith published his findings of some experiments where he used a small-bore canula in connection with the vitreous chamber of the eye. The small size bore of the canula vitiates his results. Early investigators have pointed out the danger of obtaining inaccurate data with just such a canula in the vitreous chamber, and I can verify their conclusions as to these inaccuracies.

During my experiments I made a canula of the same size as used by Priestly Smith in the vitreous, for my work in the anterior chamber. These experiments were conducted on live animals, and an air bubble in a capillary glass tubing was used. The bubble oscillated synchronously with the heart beat when the canula was in the anterior chamber, but the bubble soon became fixed when the same canula was introduced into the vitreous. With a much larger canula in the vitreous I was able to obtain the same ratio of bubble oscillations as had been obtained in the aqueous chamber.

For over three years I have been working with the Schiotz, Gradle, and other tonometers, having the eye under observation in connection with the manometer. Human and animal eyes, both in situ and enucleated, have been used, and I am unable to confirm the readings of the Schiotz and Gradle instruments.

I have been fortunate in obtaining two living human subjects on which I could make comparative readings, with the tonometer and

manometer. In both instances the manometer registered an intra-ocular pressure 12 to 25 mm., higher than that indicated at the same time by the Schiotz tonometer. On one of the above eyes, subsequently enucleated, I was able to make tests which tallied with the readings taken with that eye in situ. Of the other eye I was unfortunately unable to obtain an absolutely perfect air-tight joint between the eye and manometer after enucleation.

I have constructed a tonometer of the impression type, which gives direct readings in millimeters of Hg. manometer, on the scale of the instrument, and in which there is no changing of weights to obtain the full range of intra-ocular pressures. The scale is placed as close to the observed eye as possible, and the instrument is more readily manipulated by one operator. The plunger is so fitted in the foot-plate barrel that approximately 1 mm. space separates it from the barrel, and thus all tendency to capillary attraction of fluid between the two is destroyed.

I think no greater accuracy can be obtained in an instrument which measures the intra-ocular pressure from the exterior of the eyeball. With all the faults of instrumental tonometry many experimentors have repeatedly demonstrated that the modern tonometers are by far more accurate than digital tonometry.

Batten measured the finger sense of a number of skilled ophthalmologists, assembled at the Oxford Congress of 1914, and found this sense proved a most untrustworthy guide as judged by the readings of manometer controls.

Of the value of the tonometer as an aid to the diagnosis of glaucoma much has been written, so I will conclude this subject with a few simple suggestions as to the use and interpretation of the findings by the tonometer.

I have noticed the suggestion of some writers that an anesthetic such as holocain or *cocain* be used. It is my opinion that where there is a suspicion of increase of intra-ocular tension, *cocain* should not be used, unless the patient can be under observation for some hours afterward. The effect of holocain on the eye for tonometry is superior to *cocain*, as its anesthetic properties are sufficient, and it does not produce the drying of the cornea as with *cocain*, and its effect of mydriasis and paralysis of accommodation are almost nil.

I have known of two cases of acute inflammatory glaucoma which

followed the application of cocain to the eye. It is quite possible that they were both predisposing cases. One of these came to me with a history of having had cocain used in that eye for the removal of a chalazion. That night the eye became very painful, red and was sensitive to the touch. The vision became greatly reduced. The next day she was too sick to leave her bed. When I first saw her, which was ten days later, she recited practically all the symptoms of a severe attack of acute inflammatory glaucoma. The tension with a Schiotz tonometer registered O. D. 62—O. S. 20, and with my instrument the readings were O. D. 78—O. S. 32. Myotics were used and she was ordered to the hospital for operation for relief of the glaucoma. About a year later she developed an acute attack of glaucoma in the other eye, and I operated that eye also.

Another patient came under my observation after having had cocain used for the removal of a foreign body from the cornea. As far as I know this patient never developed glaucoma in the other eye. One of my hospital colleagues reported to me a case of glaucoma following the instillation of cocain.

In taking the intra-ocular tension with the tonometer it is essential that the instrument be placed squarely on the center of the cornea, with the long axis of the tonometer coinciding with a line extending upward as an axis from the anterior pole of the eye. The instrument should in no case be tipped to one side or the other from a vertical direction, but an allowance of not more than 5° forward or backward to obtain a square footing of the instrument on the center of the cornea is permissible. I have found operators have made more consistent readings by allowing the instrument to incline slightly forward or backward (not over 5°) to obtain a good placement of the instrument, than to insist on the absolute vertical direction with a tendency to faulty position of the footplate.

One good reading of the instrument should be preferred to an average of three or four readings which are more or less uncertain.

The subject of the limits of normal intra-ocular tension has received a vast amount of comment, but the absolute limits of normal tension are yet to be obtained. Lackowitsch with a Maklakoff tonometer determined the normal intra-ocular tension to be 26 mm. Hg. Wahlfors with a manometer in connection with a normal human eye determined the pressure to be 26 mm. Hg. Golowin determined that

pressures above 40 mm. Hg. indicated glaucoma. With the Schiotz instrument the normal readings are placed between 15 and 25 mm. on the accompanying chart, and with my tonometer the corresponding limits are 22 to 40 millimeters of mercury pressure.

There is a place in the literature of glaucoma for what I call transitory increases of intra-ocular tension. Patients will relate symptoms which are suggestive of attacks of glaucoma. They speak of a blurring of the vision or may say that objects appear as though seen through a thin mist, and that the eye has a peculiar feeling. These attacks usually last but a short time, and I have not had the opportunity to examine these patients while the condition is present. I have seen them in the interval, and then the tonometer has mostly recorded a tension not above the normal limit but in the upper half of the normal scale. The importance of making an examination during the attack with the hope of finding the cause has been explained to the patient, but I have not succeeded in making an examination during an attack. Perimeter readings of these patients in the interval have not disclosed any recessions from the normal field.

One patient reporting these transitory attacks in the interval had normal vision. A tonometer reading of O. D. 34 mm. Hg. and O. S. 33 mm. (McLean tonometer) was made and the perimeter readings were normal. Another oculist had evidently suspected glaucoma, as the patient had a copy of a prescription for a miotic, which, however, had not been tolerated with comfort and was soon discarded.

That with the tonometer the diagnosis of glaucoma is made easier is incontrovertible, but perhaps the most valuable aid this instrument gives us is its help in the medical treatment of non-surgical cases of glaucoma, and the after-treatment of surgical procedures for the relief of glaucoma. With the tonometer we can follow these cases and determine accurately the progress of each case.

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BLOOD PRESSURE IN GLAUCOMA.

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FOR many years it has been held that changes in the blood pressure affect the intra-ocular tension, a rise in the former being followed by a rise in the latter. Experiments upon animals by a great many workers seemed to bear out the truth of the idea. Henderson, Starling and Hall, among the more recent workers, made observations on this point.

When it is attempted to show that in glaucoma the same conditions obtain we find a diversity of opinion which throws the whole situation into chaos.

Terson and Campos in an examination of a series of cases found some severe cases of glaucoma with normal blood pressure. Joseph finds a high pressure in eighteen cases. MacRae, however, makes the criticism of the work done by these men that the Potain sphygmomanometer which they used in their work was not accurate.

Kramer finds in a series of fifty-four cases that the blood pressure was higher than normal in thirty-five per cent. and lower than normal in fifteen per cent. In a series of controls the relative proportions were the same, while a group of medical cases with high blood pressure showed no increase in intra-ocular pressure as measured by the tonometer of Schiotz.

De Schwenitz says: "Arterial degeneration may be responsible in the hemorrhagic forms of glaucoma, and believes that the higher grades of degeneration may render the prognosis unfavorable and undoubtedly be responsible for the hemorrhage and other complications arising from an otherwise well-performed iridectomy."

Russel claims there is no certain method of measuring the blood pressure clinically, inasmuch as the condition of the vessel wall is an important factor. He claims that one measures with the Riva Rocca type of apparatus—which is considered the most accurate—the blood pressure plus the resistance of the artery to obliteration of its lumen.

This would seem a very important factor, because most glaucoma

cases occur after forty years of age, and many conditions may arise to alter the vessel walls at this time of life, such as syphilis, gout and the conditions of living in the twentieth century. Also this difference would be noted in the different races due to modes of living. For instance the American is predisposed to kidney disease and a high pressure is to be expected.

Fox's case (which however is a report of only one case) is probably the best example of glaucoma in which the eye tension was affected by the blood pressure. A venesection in this case of twenty ounces reduced the pressure from 265 to 150. Previous to the venesection, miotics were of no service, but afterward were used with good effect reducing the intra-ocular tension.

Oertel in a series of eight cases after mountain climbing found an increase in pressure in all, the maximum being forty-three millimeters.

Huertle reports after beginning severe exertion a rise in blood pressure of thirty to forty millimeters. Such an increase in pressure in a person with hypertension might easily lead to ruptures of cerebral arteries or alterations in the eye-vessels.

MacRae reports three cases of young subjects in which the blood pressure and eye tension were taken after violent exercise. In each case the blood pressure was higher after exercise. In only one case was there an increase in the eye tension and that was only one millimeter. A week later the same experiment was performed on the same patient with the opposite effect; this time the eye tension was lowered one millimeter.

It will be necessary to differentiate between transitory and permanent high pressure. For instance, in eclampsia we have a transitory high pressure, which is often followed by changes in the eye-vessels, but I have seen no reports of glaucoma being immediately caused by this disease. Permanent high pressure is most frequently a manifestation of kidney involvement. Miller suggests that time may show all cases of high pressure to be of renal origin. About sixty per cent. of the cases show microscopical evidence of nephritis, and negative urinary findings do not exclude renal involvement.

From an examination of the literature, I am convinced that blood pressure is not an important factor in maintaining the intra-ocular tension. That it does help has been proven.

I do not believe one would be warranted in pursuing this subject to the extent of examining a large number of cases with controls. This would be the only way to get definite data and it would take months if not years to accomplish such a task. In view of the findings already reported it would be wasted effort.

Remembering that blood pressure helps to maintain the intra-ocular tension, it would be well to record the blood pressure in our eye cases and advise our patients as to diet and other means of combating the tendency toward rising.

On account of the frequency of kidney disturbances, the general principles of treatment are directed toward the diminishing of waste and the elimination of the same through the skin and bowel. Animal proteins should be reduced and the patient given sweats two or three times a week. The bowels should be kept free with saline laxatives. It is not within the province of this discussion to go deeply into the treatment of high blood pressure, but I wish to emphasize the point that general care in regard to diet will give the patient comfort. I do not believe it wise to place too much dependence upon drugs.

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CYCLO-DIALYSIS.

IRA O. DENMAN, M. D.,

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PHYSGIOLOGISTS declare that the aqueous humor is secreted by the ciliary body and processes, that it passes forward through the zonule of Zinn, the posterior chamber, pupil, anterior chamber, angle of the iris, canal of Schlemm, and spaces of Fontana into the supra-choroidal space, where its absorption is accomplished.

It is well established that obstruction to the exit of this fluid from the eye gives rise to a condition which we know as glaucoma. All measures, therefore, which are directed towards the relief of glaucoma, must seek to accomplish the feat of restoring the penetrability of the natural exit or to make a new or artificial one, as a prolongation of the increased pressure of the pent up fluids of the eye results in an impairment or loss of vision through destruction of some or all of the fibres of the optic nerve where it enters the eyeball at its posterior pole.

The possibility of opening the obstructed angle of the anterior chamber by miotics and general measures to allay congestion divides the treatment of glaucoma into (1) Medical and (2) Surgical.

Miotics act by contracting the pupil, thus stretching and thinning the iris, which enlarges the space at the angle of the anterior chamber and in some instances affords relief.

The surgical treatment is much more effective, both as an immediate necessity and as a measure of permanency, when a choice between the two lies open, to say naught of its supreme value in the relief of pain and prevention of blindness in those extreme cases in which there is no alternative.

The surgical treatment of glaucoma, always profoundly interesting and important since von Graefe introduced iridectomy sixty years ago, has claimed still greater attention during the past ten years, due to the firm establishment of the so-called modern operations.

Prior to this decade, iridectomy was the dominant procedure for all forms of glaucoma, acute and chronic. Oculists observed that

after iridectomy tension more often returned in the chronic than in the acute cases, due to prolonged pressure of the iris root against the corneo-sclera, with firm fibrous adhesions thereto, and the operation fails to effect an opening through these tissues. In the acute form of the disease, however, the prompt incision of a portion of the iris and the resultant opening of the spaces of Fontana is in the opinion of most ophthalmologists still the most dependable surgical measure.

Of the newer operations most of them seek to accomplish a filtration of the aqueous, either by incarceration of a filament of the



FIG. 1.—Normal anatomical structure of angle of anterior chamber.

iris tissue or conjunctiva in the incision or by some form of sclerotomy, to allow an escape of the fluid through the sclera to the sub-conjunctival space. Prominent among these are the sclerotomy of Lagrange and the corneo-scleral trephine of Elliott. An array of other procedures have been introduced all looking towards the accomplishment of relief of intra-ocular tension by means of the establishment of an avenue of escape for the aqueous other than that of its natural course, viz., the angle of the anterior chamber.



FIG. 2.—Spatula, making the cyclo-dialysis.

All such operations must of necessity leave as a permanent aperture some opening in the cornea or sclera, the protective tunics of the eye, leaving the conjunctival layer as the sole protection of the contents of the bulbus.

The writer believes that many of the complications arising from

such procedures, especially late infections through the thin conjunctival flap, should be seriously contemplated. If glaucoma can be relieved by the re-establishment of drainage through the normal channel—the angle of the chamber, and at the same time leave the cornea and sclera intact, should not such an operation appeal to one's reason?

Cyclo-dialysis, introduced by Heine, of Breslau, in 1905, accomplishes the above result. The writer was the first in this country to describe the technique of this operation in a paper before the American Homœopathic O., O. and L. Society at Kansas in 1908.

TECHNIQUE. The eye, cleansed and cocainized and speculum in-

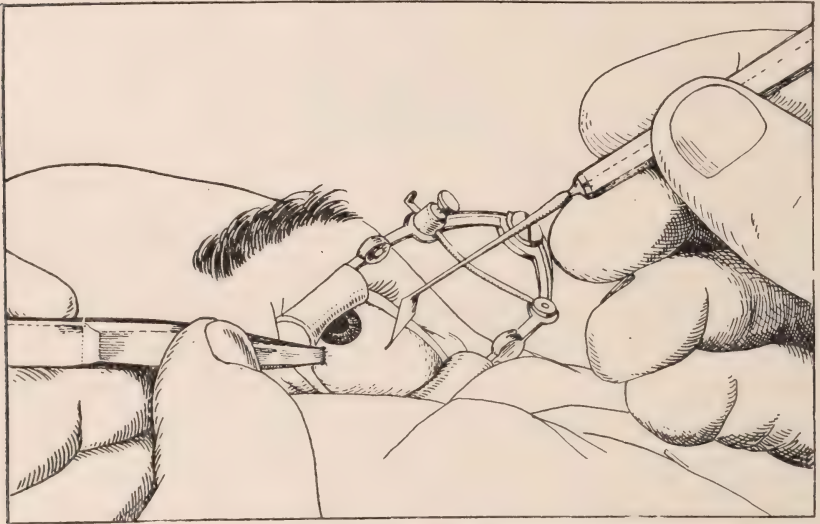


FIG. 3.—Use of keratome in the initial incision.

serted, is grasped by fixation forceps applied near the upper and inner corneo-scleral margin, and is rotated upward and inward. The conjunctiva is incised and raised as for a tenotomy, and then, with the side of the point of a keratome, a careful dissection through the sclera is made at a point about 5 mm. from the limbus at the outer and lower angle, about midway between the insertions of the external and the inferior recti muscles. The incision parallels the limbus and is less than 2 mm. in length, being only sufficiently long to admit an ordinary spatula, used in replacing the iris after iridectomy. The dissection must be slowly and carefully made stopping so soon as the black color of the pigment epithelium of the uvea appears, and being careful not to injure the ciliary body. The spatula should be repeatedly tried, and as soon as it will enter the incision is complete. The spatula is bent

at an angle of 45° and passed into the incision, but immediately that the end has passed to the bottom of the cut, the handle is quickly depressed, so that the spatula passes through the supra-choroidal space, and, directed toward the anterior chamber, penetrates the pectinate ligament and appears in the anterior chamber. The next step is to rotate the handle of the instrument, causing the blade to pass both upward and downward. These movements destroy the pectinate ligament for a distance of about a quarter of its circumference. The instrument is then withdrawn and one stitch taken in the conjunctiva to close the incision.

Unfortunately we have not as yet a standardized operation—none a specific for glaucoma; whatever method we adopt for the surgical

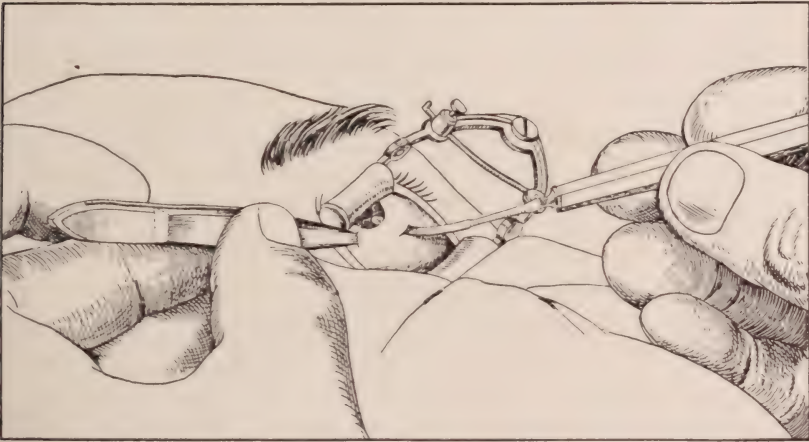


FIG. 4.—Insertion of spatula.

treatment of this disease is sure to prove disappointing in a certain percentage of cases. Cyclo-dialysis is no exception to this rule. However, the writer feels that many failures are due to a faulty technique which may occur to anyone especially in their earlier experiences with it. In the writer's opinion and experience with the use of this operation almost exclusively in chronic cases for eight years, the tension in a properly performed cyclo-dialysis is *immediately lowered*. Many writers state that in some cases tension is not lowered for several days, if at all. Another criticism is that the tension soon returns, and section of some such eyes shows the ciliary body reattached to the sclera as firmly as before. I shall offer an explanation of these two conditions as follows: When the tension is not lowered, it may be due to an

error in introducing the spatula into the anterior chamber by placing it either too far forward or too far backward. When the point of the instrument is applied too firmly to the sclera, that is, pressed too much forward as it is introduced toward the anterior chamber, it may penetrate the structure of the cornea, separating Decemet's membrane from the substantia propria. Such an accident causes a total failure of the intent of the operation, as the chamber in such case is of course not entered at all—merely a blind puncture of the corneal tissue. In case the spatula is entered too far backward, the root of the iris is penetrated, and being elastic muscular tissue, highly vascular, the aperture may or may not allow the escape of some fluid, but at any rate it is quickly sealed up again and no benefit results from the operation.

As a measure of securing permanency from this procedure I desire to emphasize these points in the technique, and, furthermore, a free sweep of the spatula upward and downward after it is well into the chamber, separating the ciliary body as stated for fully one-fourth of its circumference. The circular fibers of the iris then serve to draw the ciliary body far enough away from its former attachment to prevent its reattachment. This feature can be augmented, of course, by the instillation of eserine, if deemed advisable.

The small incision in the sclera in the beginning of the operation is important. I use a narrow spatula a little more than 1 mm. in width, and the incision is no longer than this; that is, the spatula enters snugly so that there is no liability of the escape of the uvea through such a tiny cut, and in the healing the sclera is tightly and strongly sealed, leaving no impairment of its protective function both as to trauma and to deep infections. Without comment, I invite the reader to contrast this condition with the eye which has had a portion of its protective coat removed. Many pages are required to discuss the various complications which arise during and after such operations.

SUMMARY. 1. Cyclo-dialysis intends to secure the re-establishment of the normal drainage of the intra-ocular fluids through the *natural* channels and not through an artificial orifice.

2. The operation does not impair the function of the sclera, the protective tunic of the eye.

3. There is no prolapse of the vitreous, iris, ciliary body or choroid.

4. There is no iridectomy. The function of the iris is not disturbed.

5. There is no change in the corneal curves, so vision is never impaired by an astigmia.

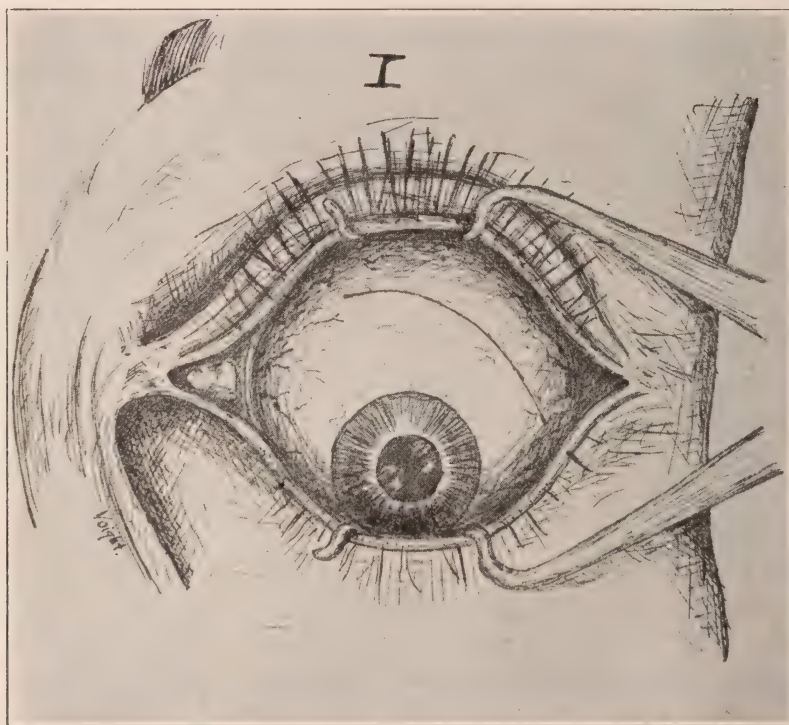
6. Cosmetically, there is positively no trace left of an operation ever having been performed.

424-5-6-7 Ohio Bldg.

A SUTURELESS FLAP FOR TREPHINING OR CYCLO-DIALYSIS.

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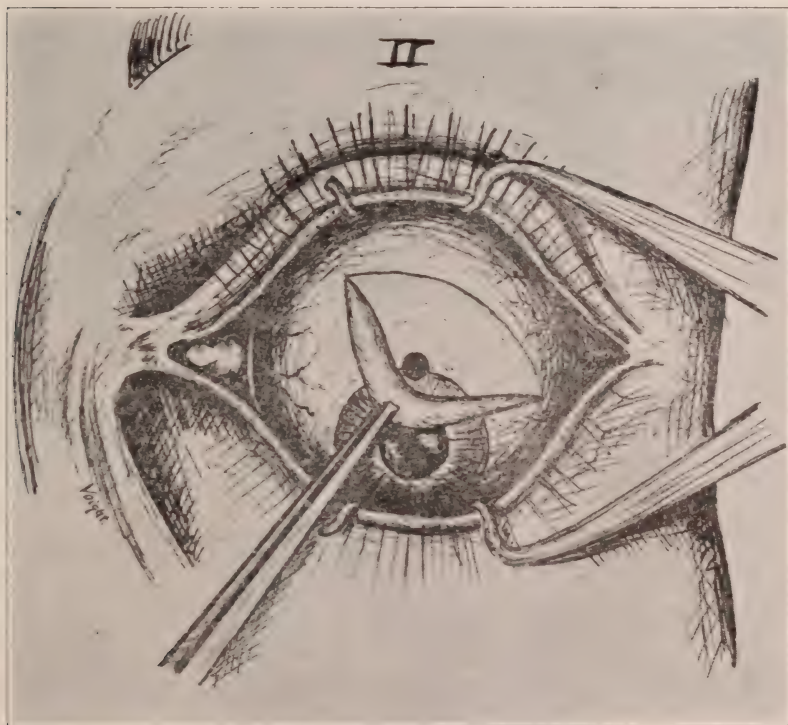
THE accompanying drawings will illustrate what I believe to be an ideal conjunctival incision for the trephining operation in glaucoma. There are two principal reasons for its employment. First, there is no necessity for a suture to hold it in place after returning the flap to position following the completion of the operation.



Illustrating the Location of the Incision.

As will be noted, the incision is made in a slightly curved manner, beginning about over the attachment of the external rectus and extending in a slightly circular direction upward and inward to a position about half-way between the attachment of the superior rectus and

the inner canthus. It should also be about ten millimeters distant from the sclero-corneal limbus. The flap is then seized at about its centre and drawn gently downward. With a pair of sharp pointed scissors the conjunctiva is loosened from the sclera, being careful to dissect close to the scleral tissue. This dissection is carried along until it reaches the cornea, and out upon the cornea the required distance. The trephine is then placed in position, the puncture and iridectomy

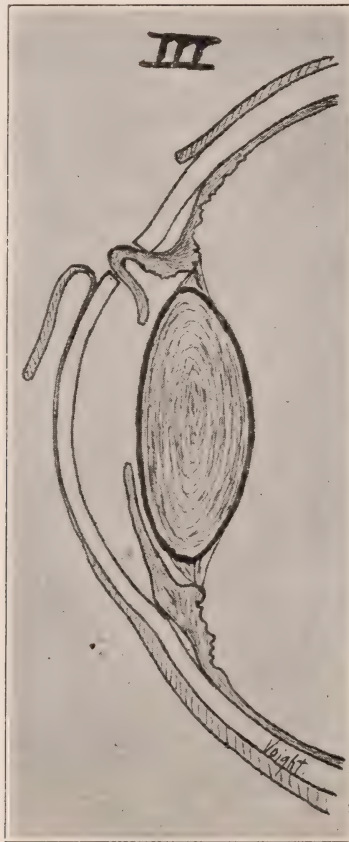


Illustrating the Flap Reflected Downward over the Cornea and the Trephine Opening.

made and the flap returned to its natural position over which the lid is carefully closed. It will be found that this flap will remain in place without a suture, healing taking place by first intention. All irritation from suture and knot is thus done away with.

The second advantage in this particular incision is the fact that the circulation of the flap is not disturbed in any way. The old-time inverted V-shaped incision with the base at the corneal margin has

seemed to me to be wrong. Unless made very wide so as to retain some blood supply on either side of the cornea, the circulation of the flap is almost entirely destroyed and great danger of sloughing occasioned. The flexibility of the conjunctiva renders it possible to make my incision, as I have suggested, some distance from the cornea. The retraction over the cornea is easily sufficient to accommodate the trephine in the desired position upon the sclero-corneal limbus.

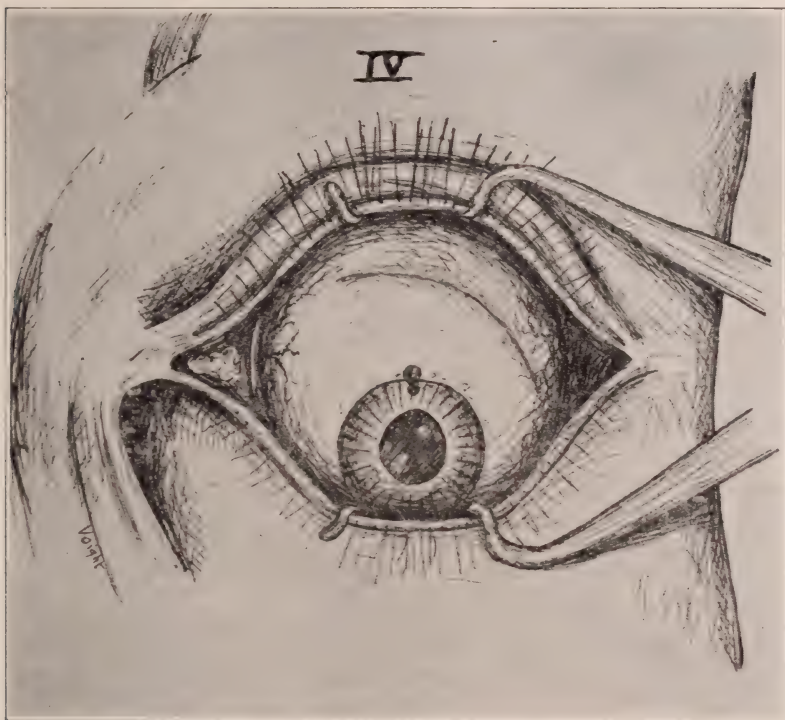


Illustrating the Flap Turned Down and the Bulging of the Iris into the Trephine Opening.

Modified to suit special needs, this incision may be used for cyclo-dialysis, or any operation upon the sclera and the irritation and danger from infection which attend the use of a suture avoided. The

A SUTURELESS FLAP FOR TREPHINING OR CYCLO-DIALYSIS.

length of time required for healing will be found to be greatly shortened.



Illustrating the Completed Operation with the Flap Returned to its Normal Position.

University of Michigan.

RESULTS OBTAINED BY THE FOX MODIFICATION OF THE ELLIOT OPERATION FOR GLAUCOMA.

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THE surgical treatment in both acute and chronic glaucoma has always appeared to me as the rational method to be followed in giving permanent relief to this progressive affection of the eye. There are cases in which the medicinal treatment had to be carried out temporarily, but I must confess that the abatement of the trouble was only temporary, and later permanent benefit was only obtained by surgical methods.

At a meeting of the International Medical Congress held in London, at which I was present, the one subject that elicited the most valuable discussion before the Section on Ophthalmology was "Glaucoma Operations With Special Reference to the Comparative Results Attained by Iridectomy and Its Recent Substitutes." Surgeons of experience from all parts of Europe, India and America joined in the discussion, and there was a consensus of opinion that iridectomy was still the operation of preference for acute glaucoma; that in chronic glaucoma iridectomy was very uncertain and for this reason ophthalmic surgeons, the world over, were adopting various methods which were more satisfactory in their results. These operations and what led to their adoption I shall discuss later. What ophthalmic surgeons now need is a better knowledge of the various forms and stages of the disease so that they may the better select their procedure.

The two most conspicuous men in this historic gathering were undoubtedly Professor Lagrange, of Bordeaux, and Lieutenant Colonel Elliot, of Madras, India. Professor Lagrange gave an interesting account of the manner in which he developed his method of combined iridectomy and sclerotomy and gave the comparative results of this and other modifications in 137 cases.

Lieutenant Colonel Elliot maintained that trephining far forward was at once the easiest, safest, and best method of securing the needed

drainage; the wound was in shape, size, and position best adapted to the end in view, and it had proved admirably successful in 900 cases operated upon in India. Whilst all were agreed that the glory of the achievement of von Graefe in the discovery of iridectomy could never be dimmed, the excellent work done by Argyll-Robertson, Priestley Smith, Freeland Fergus, and Herbert was gracefully acknowledged by Sir Anderson Crichtett, the Chairman, and by the whole section. It was considered that greater advance had been made in the treatment of glaucoma, especially chronic glaucoma, during the last five years than had taken place since the time of von Graefe. The discussion occupied nearly the whole day.

IRIDECTOMY. Iridectomy has been and undoubtedly still is the operation to be relied upon for the relief of acute glaucoma, although further experience may show that the Elliot operation, to which I shall have occasion to refer, is equally beneficial. If von Graefe had contributed nothing more than iridectomy to ophthalmology, it would be sufficient to immortalize his name, but it has long since been shown that the operation is not generally applicable to all forms of glaucoma.

If iridectomy were not successful in relieving or retarding glaucoma, it was the custom to consider the case as one of a malignant character, or it was supposed that there had been some mysterious fault in the technique and execution of the operation.

In course of time when a large number of pathological specimens of cases operated on had been examined, it was evident that those that had retained permanent drainage from the anterior chamber through a cystoid cicatrix were the most successfully and permanently relieved, and towards the close of the 19th century it was realized and boldly asserted that iridectomy was not curative in all cases, and that some new method of operating for glaucoma which insured filtration from the anterior chamber must be sought for.

In 1901 DeWecker made his report upon the subject to the French Ophthalmological Society, and Parinaud, in the discussion on that report, stated that he had endeavored to make filtration cicatrices by leaving the iris incarcerated in the wound. From 1901 until the present time several new operations with various modifications have been introduced with a view to procure permanent drainage of the aqueous in glaucomatous eyes. In 1903, Major Herbert, an English military surgeon practicing in the East Indies, published the results of

an operation on 130 cases of glaucoma by intentionally leaving the prolapsed iris in the scleral wound, but he was conscious of a possible danger in making a hernia of the iris and sought to introduce a fold of conjunctival flap.

Herbert afterwards introduced a wedge isolation operation—a modified sclerotomy—for the relief of glaucoma, and in his own practice and that of Priestley Smith the results are said to have been most satisfactory and the failures but few. The earlier operation of Herbert was performed with a narrow, tapering von Graefe knife, but two knives are now commonly used in place of the von Graefe knife; a keratome for the primary incision and a short, blunt-pointed, narrow blade for the lateral cuts. Major Herbert performed his earlier operations with a narrow von Graefe knife, either in the lower outer or upper outer quadrant of the eye. The knife was made to penetrate the conjunctiva 2.5 mm. from the point at which it was intended to perforate the sclerotic. After sliding the conjunctiva on the point of the knife, a 2 mm. scleral incision was made parallel with the corneal circumference and 1.5 mm. from it, entering the anterior chamber close to its angle. At the two ends of the small section the edge of the knife was turned forwards and incisions made with slow sawing movement to the corneal margin. These two incisions formed the sides of the small flap, the primary incision the end of the flap, and the whole was subconjunctival. Considerable conjunctival edema resulted from the immediate outflow of the aqueous.

The keratome, which is really a bent, broad needle not wider than 3.5 mm., is now used for the primary incision and a short, blunt-pointed narrow blade for the lateral cuts. By using a bent instrument it is possible to make the incision upwards or downwards. Before the operation the pupil is contracted as far as possible by eserine, and usually one or more instillations of adrenalin are made in addition to cocaine, according to the degree of glaucomatous congestion of the eye.

Priestley Smith is of the opinion that the later modifications in the Herbert operation have not made results more certain.

For the purpose of facilitating the making of the lateral incisions, M. Bishop Harman has introduced his twin sessions. The lower or male blade is flat and beveled so that each side represents a sharp edge. Its free end is rounded and blunt, and projects 2 mm.

beyond the female blades. The upper, or female blades, are a pair of parallel, sharply beveled blades springing from a common stump. When the handles of the scissors are closed the female blades shear down on the side of the male blade, and come to rest in overlapping it.

In operating with this instrument Harman has found it convenient first to turn forward a flap of conjunctiva from the chosen site of the sclerotomy: then the keratome is inserted into the sclerotic 3 mm. from the clear corneal margin, and passed through under the sclerotic until its point appears within the corneo-iridic angle; it is pushed on until a clear 3 mm. of the blade is within the anterior chamber. The keratome is then withdrawn. Now the male blade of the twin scissors is pushed along the track of the wound until the projecting 2 mm. of the blades show within the anterior chamber; the scissors are then closed—the cuts made—the male blade gently withdrawn and with a replacement of the conjunctival flap the operation is complete.

Heine in 1905 made known his operation of cyclo-dialysis, which is essentially a detachment of the ciliary body and effects a connection between the supra-choroidal space and the anterior chamber. In 1906 Lagrange introduced his operation by which he endeavored to obtain a filtering cicatrix without including the iris in the lips of the wound. This he believes he has succeeded in doing by an operation combining iridectomy and sclerotomy. About half an hour before a few drops of eserine are instilled, and as the time for the operation approaches cocaine and adrenalin are dropped into the eye several times to produce complete insensibility of the iris and obvious ischemia of the mucous membrane. In addition to the instruments ordinarily used for iridectomy is needed a small pair of curved scissors, which should be very sharp. In the first stage the sclera is punctured with a von Graefe knife at a distance of 1 mm. from the limbus, and the counter-puncture is made at the corresponding point. The sclera is divided upwards in the irido-corneal angle. In terminating the incision, the cutting edge of the blade is directed backward in such a way as to bevel the sclera. When the knife is beneath the conjunctiva a large conjunctival flap is made. In the second stage the conjunctival flap is raised by means of toothed forceps and a sufficiently large piece of the sclera is cut from the exterior lip of the incision. In the third stage iridectomy is performed in the usual way, and finally the con-

junctival flap is used to cover the wound. The Lagrange operation has been performed extensively throughout France, and modifications of it have been made by Holth, Dor, Jacqueau, and Coppez. In many cases remarkable success has followed the operation—and according to French writers there have been failures, too.

Abadie undertook to denounce sclerotomy, whilst he defended iridectomy in an unmistakable manner. He concluded his article by saying: "Hold iridectomy as an operation of choice in glaucoma, and endeavor especially to make it as simple and correct as possible." In reply M. Légrange asserted that "the happy results from sclerotomy are infinitely more lasting and more numerous than by every other method."

These two great men in the profession have drawn directly opposite conclusions as to the relative value of two important operations. Time alone can work out the problem satisfactorily.

Bettremieux, of Robiax, France, has since 1908 practiced a simple sclerotomy, which he described as non-perforating. He snips away particles of the sclerotic for a width of 2 mm. and a length of 10 mm. outside of the limbus, but he does not consider it necessary to penetrate the sclerotic, as he is of the opinion that by his limited operation he establishes anastomoses between the deep vessels of the pericorneal region and the conjunctival and subconjunctival vessels. Bettremieux has reported some remarkably good results from his operation, and singularly he has performed his operation with success upon two cases of detachment of the retina in myopic subjects.

We now come to the consideration of the operation of simple trephining of the sclera for the relief of glaucoma, which is generally spoken of as the Elliot operation.

Major R. H. Elliot operated upon a large number of cases of glaucoma by trephining without being aware of similar work having been already attempted in Europe. His first trephining of the sclera for glaucoma was performed August 2, 1909, and it was reported in the *Ophthalmoscope* for December, 1909. Dr. Freeland Fergus, of Glasgow, had reported a similar operation two months earlier, and it was reported in the *British Medical Journal*, Oct. 2, 1909.

Dr. Argyll Robertson (in the *Royal London Ophthalmic Hospital Reports* for May, 1876) recommended the drilling of a hole in the coats of the eyeballs for glaucoma when an iridectomy could not be

performed; Blanco also recommended it in *Klinische Monatsblätter für Augenheilkunde* XII, Band ii, p. 150, 1903, and Frolich, *Ibid.* May, 1904.

In the majority of cases Major Elliott relies upon cocain, solution 4 per cent., for anesthesia of the eyeball; after the preparatory treatment has been carried out, administration of a free saline purge, the application of four leeches around the orbit, the instillation of eserine and an opium sleeping draught. The first step in the operation is the formation of a large triangular flap from above the cornea, the attached base being at the sclero-corneal margin. The dissection is continued for a distance of a millimetre into the substance of the corneal tissue in order that the entrance of the trephine into the chamber may be assured by being applied exactly over the limbus.

In all this dissection it is best to keep the points of the scissors directed towards the plane of the posterior pole of the lens; otherwise it is possible that a buttonhole will be made in the conjunctival flap. The spot selected for trephining should be as close to the limbus as possible; indeed the aperture becomes a sclero-corneal rather than a scleral opening. The trephine should be used with quick, light movements and care should be taken that its first application serves to bite into the sclera before it is raised—to see the progress made, and in his early cases the surgeon feels the need of frequently raising the trephine to see how he is progressing. But he will soon be able to recognize the points which indicate that he has penetrated the chamber.

(1) As soon as the chamber is tapped aqueous wells up along the side of the instrument and mingles in streaks with the surrounding blood; (2) there is a sucking sensation as soon as the trephine's work is done, and (3) the patient makes a slight, peculiar movement at that moment. Should the disc remain attached to one point of the sclera it is easily separated by a cut with iridectomy scissors, but should the disc happen to fall into the chamber it need not be a cause for anxiety. Should the iris bulge into the aperture the moment the disc is cut through, it must be snipped in a radial direction in order that the aqueous may escape. The membrane often goes back of itself, but if it does not a piece must be excised, care being taken to avoid traction on the iris.

In making the toilet of the wound, Major Elliot uses a McKeown

irrigator with good results if there are any large tags of iris in the wound, or if the chamber fills with blood. The closure of the wound is made by a flap without need of suturing.

It is interesting to note that thoughtful writers upon the newer operations for glaucoma make repeated and emphatic reference to the value of equatorial or posterior sclerotomy, the first operation designed for relieving glaucoma. It was designed by Guerin, a surgeon of Lyon, who, in his "Treatise on the Diseases of the Eye," published in Lyon in 1769, expresses himself in the following terms:

"When the vitreous humor is in too great abundance, the pupil is dilated to its fullest extent and has almost lost its elasticity. Such patients complain of a deep, dull pain at the back of the eye, which extends sometimes to the front of the head, because the volume of the vitreous body compresses and dilates the retina, an expansion of the optic nerve. The sight is affected because the retina is injured."

After referring to medicinal remedies, Guerin adds: "If all remedies are without success, one comes to the puncture of the eye in the sclerotic or opaque cornea. That puncture ought to be simple and without much preparation and it can be executed by a rather broad cataract needle. The effort which is being unceasingly made by the over-dilated sclerotic to return to its natural state suffices for the expulsion, little by little, of the superfluous humor."

As regards the relative value of various operations for glaucoma, it would appear that almost all ophthalmic surgeons are unanimous as to placing their reliance upon iridectomy as the curative operation for glaucoma. Great success has, undoubtedly, followed the performance of the various newer operations for chronic glaucoma, but none of them has given me greater satisfaction than the Elliot trephining of the sclera. As already stated, Major Elliot makes the base of his triangular flap at the sclero-corneal margin, but in several instances I have reversed this practice, and, as in the Van Lint sliding flap operation for cataract, I seize with the forceps the conjunctiva on the inner side of the right cornea about 4 mm. below its summit and dissect it around the upper corneal margin to the outer side; then with scissors I detach the conjunctiva at the lowest point of the inner side. From this point I make a perpendicular incision for 14 mm. through the conjunctiva, which is continued diagonally upwards and outwards to a similar distance.

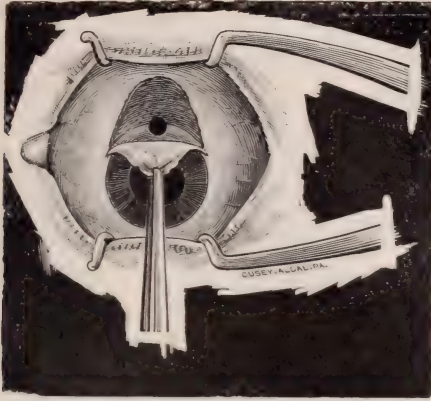


FIG. 1.—Elliot conjunctival flap and cornea-scleral (trephine) opening.

When operating on the left eye I begin the dissection of the flap on the outer side of the cornea and make similar perpendicular and diagonal incisions upwards and inwards. When completed, the flap is drawn over to its attached side on the eyeball, leaving a space for the trephining along the upper sclero-corneal margin.

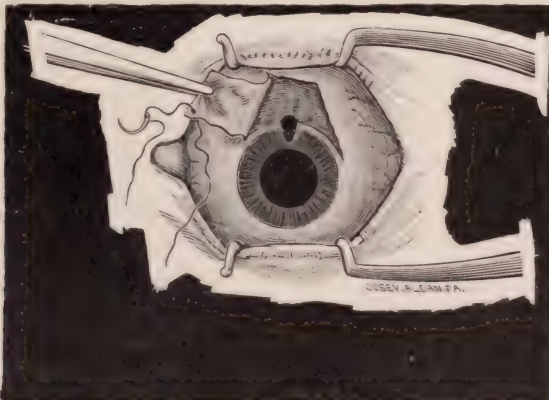


FIG. 2.—Author's modification of conjunctival flap.

After the trephining the conjunctival flap is replaced and by means of the suture already inserted, it is drawn downwards to cover the hole in the sclera and the upper part of the cornea.

From time to time I have modified the treatment of the conjunctival flap, at one time stitching it down on one side and removing the thread at the end of 24 hours; at another simply loosening the conjunctiva over the corneo-scleral opening and allowing it to heal—but the above described method has given me the most satisfaction.

My first two cases were operated upon by this trephining method

early in September, 1911, and since then I have performed it many times and in no case with bad results. In all of these cases the intra-ocular

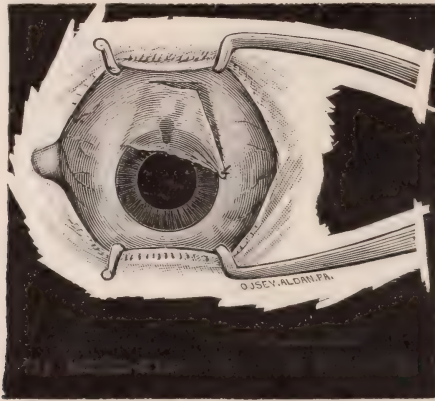


FIG. 3.—Conjunctival flap in position.

pressure was minutely taken before and after the operation by Schiötz' tonometer. This instrument gives us a very accurate estimate of the tension of the eyeball. The blood pressure was taken in each and every case, and was often found to be much above the normal. The highest was 290 Hg. In this case the tension of the eyeball was 88 mm., which was equivalent to 3 in the older nomenclature. If an iridectomy had been performed in this case retinal hemorrhage would have undoubtedly occurred, and enucleation of the eyeball would have followed. In fact, it would not have been good surgery to have tried any operation but enucleation. By performing this operation in other cases of a similar character we have at least retained the eyeball. In cases where the visual fields were very much contracted, down to 10 and 15 degrees, I have found that this vision was not only retained but in many cases it became increased. My earlier operations were made with the Stephenson trephine, but I have had the cutting parts with

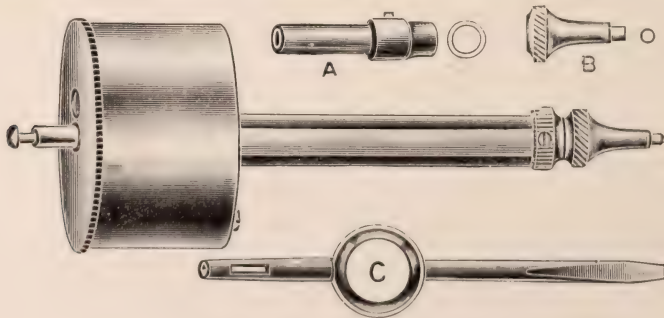


FIG. 4.— Von Hippel trephine.

stops of varied widths adapted to the Von Hippel trephining instrument, and have hereby secured greater ease in manipulating the trephine and in regulating the depth and direction of the incision.

Since 1911 I have had an exceptionally large number of cases where I have performed my modification of the Elliot method, and the drainage has been excellent. Vision has been held and the tension has been reduced to almost normal. In some cases, where the tension prior to the first operation was high (70 degrees and even more), I was obliged to repeat the trephine or perform a secondary sclerotomy in less than 5 per cent. of the cases, which I consider speaks volumes for the Elliot method.

In regard to late infection I have been exceptionally fortunate, and I attribute this to the fact that I have guarded against* pyorrhea alveolaris, which I am confident is a contributory cause of infection following operations on the eye.

In this article I have quoted from some of my earlier writings pertaining to the relation of the eye and the teeth, as well as extracted from the recent writers who have gone thoroughly into this disease and its far-reaching affects.

Looking to the operative side the success already achieved by means of iridectomy and the newer operations for glaucoma makes us sanguine in the anticipation that the treatment of that formidable disease is being rapidly perfected. Scientists in every department and throughout the world are in these days fully alive with the spirit of research, and one by one the mysteries of Nature and the complexities of disease are being unfolded to us. Surely the ophthalmologist cannot fail ultimately to find light, and reach the goal he seeks so earnestly.

303 So. 17th St.

*The Relation Between Surgical Operations on the Eyeball and Pyorrhea Alveolaris. (Alveolodental Pyorrhea), "Ophthalmology," April, 1916.

REVIEW.

THE PRINCIPLES AND PRACTICE OF PERIMETRY. By Luther C. Peter, A. M., M. D., F. A. C. S. Associate Professor of Diseases of the Eye, Philadelphia Polyclinic and College for Graduates in Medicine; Ophthalmologist to the Rush Hospital for Consumption and Allied Diseases, Philadelphia. Octavo, 232 pages, illustrated with 119 engravings and 2 colored plates. Cloth, \$2.50, net. Lea & Febiger, Philadelphia and New York.

The subject of perimetry is an important one, too often neglected by the busy man. By perimetric examinations carefully conducted, the ophthalmologist is made aware of retro-bulbar lesions in their earlier stages, generally before knowledge of the condition can be ascertained by the ophthalmoscope. Contraction in the field of vision or enlargement of Mariotte's blind spot can be determined only by one of the methods of Perimetry. The author favors rather the campimetric method, first suggested by von Graefe. He does so because he evidently has found it satisfactory in his wide experience. Dr. Peter has devoted a large part of his time to the study of the subject. He therefore is in a position to speak on the subject with authority based upon practical experience. The book is written well, so that the student can understand it. It treats of the subject in a comprehensive manner, so that one can turn readily to the very subject he may desire to look up. It is concise, so that there is no waste of space. A look through the book is refreshing in that it prompts one to get busy and attempt more frequent and more accurate work along this line. The book should have a ready sale among students and practitioners of ophthalmology and neurology. For the sake of scientific medicine may it have a ready sale.—ED.

CORRESPONDENCE.

A LETTER TO THE EDITOR.

My dear Doctor:—

April 6, 1916.

There will be a meeting of the Congress of States at the Baltimore session of the American Institute, Tuesday, June 27th, at 9 a. m.

At this meeting the question of federating our state and local societies with the American Institute will be considered. Ways and means for bringing about this most important movement will be presented, and it is desirous that every state and local society have representation at this Congress.

Will you kindly appoint two or more delegates from your society who are members of the American Institute, and who you know will attend?

Federation has the approval of the Board of Trustees of the American Institute and has been sanctioned by the majority of the state societies, and we are desirous to launch the project at Baltimore.

Will you kindly give this your earnest consideration?

Fraternally yours,

SCOTT PARSONS,
Special Representative
Council on Medical Education.

G. W. MACKENZIE, M. D.,

March 20, 1916.

JOURNAL OF OPHTHALMOLOGY AND OTOTOLOGY,
Philadelphia, Pa.

Dear Doctor:

I was greatly interested in your note in the February JOURNAL, concerning the appointment of Dr. J. Hubley Schall, of Brooklyn, as head of the surgical staff of the Brooklyn Municipal Hospital, and I share in your endorsement of the *American made surgeon* whose appointment will certainly be of advantage to the hospital.

At the same time I wish very much that mention had been made of the good judgment of the commissioner who appointed as members of the same staff Dr. Mary L. Lines, Dr. Brandt and Dr. Sisson, three women who have made such reputation for themselves in Brooklyn it has seemed unjust that public recognition of this sort has been so long delayed. All the same we women doctors, wherever our field, are happy to know of such public appreciation of the clever medical women.

Fraternally yours,

JULIA HOLMES-SMITH, M. D.

PROFESSIONAL DIRECTORY

"UP-TO-THE-MINUTE INDEX" FOR QUICK REFERENCE

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PHYSICIAN AND SURGEON
124½ North Main Street

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BRONCHOSCOPY
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32 North State Street

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CENTRAL NERVOUS SYSTEM.
25 East Washington St.

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INTERNIST
122 South Michigan Blvd.

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EYE, EAR, NOSE AND THROAT
904 Union Central Building

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822 Rose Building

WM. H. PHILLIPS, M. D.
EYE, EAR, NOSE AND THROAT
1018 Rose Building

Journal of Ophthalmology Otology and Laryngology

Vol. XXII

JUNE, 1916

No. 6

Editorial

MEDICAL ASSOCIATIONS, THEIR MEETINGS AND WHAT THEY DO FOR US.

A MEDICAL Association is a collective body of physicians organized primarily for the purpose of advancing scientific medicine, and incidentally of promoting a fellowship between physicians having a common interest. That they are capable of doing even greater good no one can deny. Credit is due to the medical associations for having prompted the state to form health boards and to enact laws protecting the health of the people against infectious diseases, impure food and water, etc. The attitude of medical associations to society has ever been philanthropic and educational. If for no other reason it is the duty of every physician to belong at least to one medical association. He owes it to himself, to his clientele and to society as a whole.

Medical associations hold regular meetings: the larger, or national bodies usually meet annually for several days. Attendance at these meetings to the average man is equivalent to a short post-graduate course. Some of the lazy members find a reason for not attending, holding the opinion that if they miss a session or two they can read it up in the proceedings, which they rarely do. If they find a ready excuse for non-attendance they find a readier one for not looking up the proceedings. The fellow who attends and hears the papers and discussions first-hand has the advantage over the one who reads it up, besides it is the fellow who hears the papers and the discussions who is more likely to read the proceedings later to refresh himself and tighten his hold on the subject.

Medical association meetings broaden one's view; for instance, it has been the experience of more than one of us to hear one side

of an argument, at the conclusion of which we decided that the fellow was right; when another gets up and changes our view with equally forceful arguments on the other side of the question. Had we held either opinion before, or had we heard but one side we would remain one-sided, but having heard both sides we have broadened our views, increased our knowledge and prepared ourselves better when the occasion arises to apply that knowledge.

A medical meeting is an experience meeting where we give and accept views on every day practical problems that cannot help but improve our usefulness as practicing physicians. It is the place where a fellow learns just how much he does not know, and this is a great deal. It is inspiring.

No honest man who has ever attended a medical meeting and listened to the entire proceedings ever left with the idea that he knew it all or that he did not get something out of it that more than repaid him for the time and expense it cost him to go and return.

To the one who does not belong to a medical association of some kind the advice is offered to join one for the good it will do him and others. To the one who belongs but does not attend the advice is not to let little things keep him away from any of the sessions. Besides we owe it to the fellow who has taken the pains to prepare a paper to stay and listen. Aside from what we may learn by hearing the paper it is courtesy to give the reader an audience.

Let us as members of the O., O. and L. Society resolve at this time to lay aside our routine work and take a few days off to attend the annual meetings. By so doing we shall show appreciation of the efforts put forth, by our hosts in New York and Baltimore and the officers of the Society, to make this year's meeting the most successful in the history of the Society.

Don't forget the dates: New York, June 23d and 24th: Baltimore, June 26th and 27th. Headquarters in New York, Hotel Woodward, Broadway and 55th Street. Headquarters in Baltimore, Hotel Emerson.

G W. M.

CLINICAL SESSION AMERICAN HOMŒOPATHIC
OPHTHALMOLOGICAL, OTOLOGICAL, AND
LARYNGOLOGICAL SOCIETY.

New York, June 23d and 24th, 1916.

Owing to the character of our work only a limited number can see to advantage surgical technic, therefore cards admitting to each operation will be issued *in the order of application*.

A very large attendance is already assured and in order to see what you most desire in surgical work each member should send in at once his application, stating his first, second and third selection for each operative period.

There will be ample room for all to see and examine cases in the non-operative clinics at the Ophthalmic, where there will undoubtedly be an abundance of rare and interesting cases of all descriptions. MEMBERS SHOULD BRING THEIR OPHTHALMOSCOPES AND HEAD MIRRORS. The operative work will probably follow the schedule very closely though possibly slight changes may have to be made.

On Saturday evening there will be a dinner at the Hotel Headquarters, THE WOODWARD, 55th Street and Broadway.

Members will leave on Sunday for Baltimore, where our annual meeting will be held with the Institute.

COMMITTEE OF ARRANGEMENTS,
New York Ophthalmic Hospital,
201 East 23d Street,
New York.

FRIDAY, JUNE 23D, N. Y. OPHTHALMIC HOSPITAL.

UPPER OPERATING ROOM.

9 to 1.

Fallacies and verifications of Tonometers with a Manometer in direct connection with the interior of the living human eye,

Dr. William McLean, New York.

Enucleation of the Eye with implantation of rubber sponge in Tenon's

CapsuleDr. Fred'k G. Ritchie, New York.

CATARACT EXTRACTIONS.

Intracapsular, original method, Dr. Dean W. Myers, Ann Arbor, Mich.

EDITORIAL.

Intracapsular, Smith-FisherDr. Ralph I. Lloyd, Brooklyn, N. Y.
Intracapsular, Smith-FisherDr. DeWayne Hallett, New York.

FRIDAY. LOWER OPERATING ROOM. OPHTHALMIC.

9 to 1.

TONSIL OPERATIONS.

Tonsillectomy, original technique, in forward suspended sitting postureDr. Ira O. Denman, Toledo, Ohio.
Tonsillectomy. Original Method, Dr. Burton Haseltine, Chicago, Ill.
Tonsillectomy. Modified Sluder ...Dr. Charles E. Teets, New York.
Tonsillectomy. Freudenthal's Method in suspension position using Killian's Traveling Crane, Lynch's Mouth gag, hook and tongue depressorDr. Charles E. Teets, New York.
Tonsillectomy. Modified Sluder ...Dr. Robert M. Jones, New York.
Tonsillectomy. Digital enucleation ...Dr. Harold Foster, New York.
Tonsillectomy. Sluder-Beck, Dr. W. D. Rowland, Asbury Park, N. J.

FRIDAY. UPPER OPERATING ROOM. OPHTHALMIC.

2 to 6.

REMOVAL OF THE LACHRYMAL SAC.

Method, intranasalDr. Sidney Yankauer, New York.
Method, subconjunctival Dr. J. A. Kearney, New York.
Method, originalDr. J. Ivimey Dowling, New York.
Method, externalDr. William McLean, New York.

FRIDAY. LOWER OPERATING ROOM. OPHTHALMIC.

2 to 6.

Septum straightening, simple method; series of cases,
Dr. Irving Townsend, New York.
Frontal Sinus, modified Lothrop ..Dr. George B. Rice, Boston, Mass.
Caldwell-Luc Antrum Operation,
Dr. William H. Phillips, Cleveland, O.

FRIDAY. NON-OPERATIVE CLINIC. OPHTHALMIC.

2 to 6.

Intraocular DiseasesDr. Charles Deady, New York.
External Ocular DiseasesDr. Edw. S. Munson, New York.
Nasal and Throat DiseasesDr. Charles E. Teets, New York.
Nasal and Throat DiseasesDr. Irving Townsend, New York.

EDITORIAL.

FRIDAY. FLOWER.

2 to 6.

Tonsillectomy by Digital Enucleation . . Dr. Harold Foster, New York.
Modified Caldwell-Luc Operation on Maxillary Sinus,

Dr. Harold Foster, New York.

Demonstration of an Extirpated Larynx,

Dr. Harold Foster, New York.

Demonstration of Border-line Dermatological Cases,

Dr. Frederick M. Dearborn, New York.

Demonstration of Radium Therapy,

Dr. Marshall W. McDuffie, New York.

FRIDAY. 257 WEST 57TH STREET.

2 to 3 and 3 to 4.

Roentgenography of the Sinuses, the Pituitary Body, and Sella
Turcica; accommodating 12 physicians at a time.

Dr. W. H. Dieffenbach, New York.

FRIDAY. CLINIC ROOM. OPHTHALMIC.

8 to 10:30 p. m.

The Ocular Paralyses, Hemianopsias, Scotomata, and Vertigoes from
the standpoint of the Neurologist . . Dr. J. E. Wilson, New York.

Roentgenography of the Mastoid and the Nasal Accessory Sinuses,

Dr. Fred'k M. Law, New York.

Lantern Slides of the Temporal Bone,

Dr. G. J. Palen, Philadelphia, Pa.

Lantern Slide talk on the Neurology of the Eighth Nerve,

Dr. G. W. Mackenzie, Philadelphia, Pa.

SATURDAY. JUNE 24TH. OPHTHALMIC.

UPPER OPERATING ROOM.

9 to 1.

EYE MUSCLE OPERATIONS.

Original Tucking Advancement . . . Dr. Geo. A. Suffa, Boston, Mass.

Modified Worth Advancement . . Dr. David W. Wells, Boston, Mass.

Bishop Harmon Reefing Advancement,

Dr. Calvin E. Williams, New York.

Original Advancement Dr. Fred'k G. Ritchie, New York.

EDITORIAL.

SATURDAY. LOWER OPERATING ROOM. OPHTHALMIC.

9 to 1.

MASTOID OPERATIONS.

RadicalDr. Geo. W. Mackenzie, Philadelphia, Pa.
SimpleDr. L. E. Hetrick, New York.
RadicalDr. William F. Beggs, Newark, N. J.
Radical, with immediate skin grafting,
Dr. Wesley M. Bowers, New York.

SATURDAY. HAHNEMANN.

9 to 1.

Hare-lip and Cleft Palate Operations with Exhibition of Cases,
Dr. Geo. W. Roberts, New York.
Tonsillectomy by Digital Enucleation ..Dr. Harold Foster, New York.
Maxillary SinusDr. Harold Foster, New York.

SATURDAY. HAHNEMANN.

2 to 6.

Sub-temporal DecompressionDr. Wm. H. Bishop, New York.

SATURDAY. UPPER OPERATING ROOM. OPHTHALMIC.

2 to 6.

GLAUCOMA.

Elliot Sclero-corneal TrephineDr. DeWayne Hallett, New York.
von Hippel Sclero-corneal Trephine,
Dr. Fred'k G. Ritchie, New York.
Cyclodyalysis*Dr. Ira O. Denman, Toledo, Ohio.
Plastic Operation on EyelidsDr. Geo. A. Shepard, New York.

SATURDAY. LECTURE ROOM. OPHTHALMIC.

2 to 6.

Study of a Series of Labyrinthine Cases,
Drs. Hetrick and McLean, New York.

SATURDAY. NON-OPERATIVE CLINIC. OPHTHALMIC.

2 to 6.

Intraocular DiseasesDr. Charles H. Helfrich, New York.
Extraocular DiseasesDr. William McLean, New York.
Nasal and Throat Therapeutics ..Dr. Sam'l H. Vehslage, New York.
Nasal and Throat TherapeuticsDr. Robert M. Jones, New York.

EDITORIAL.

SATURDAY, AT 8 P. M., DINNER AT HOTEL WOODWARD, BROADWAY AND
55TH STREET.

The following Methods of Anæsthesia will be Demonstrated:

Dr. Ira O. Denman will demonstrate his special chair for Tonsillectomy in the Forward Suspended Sitting Posture, and Dr. E. I. McKesson will administer Nitrous Oxide and Oxygen by his continuous method with his own apparatus.

Dr. T. Drysdale Buchanan will demonstrate Continuous Anæsthesia through the Nose on Dr. Roberts' case.

Dr. T. Drysdale Buchanan will demonstrate Nitrous Oxide and Oxygen on Dr. Foster's case.

Dr. T. Drysdale Buchanan will demonstrate Ethyl Chloride on Dr. Foster's case.

Dr. T. Drysdale Buchanan will demonstrate Oil-Ether-Colonic-Rectal on Dr. Rice's case.

Dr. T. Drysdale Buchanan will demonstrate Vapor Anæsthesia on Dr. Bishop's case.

For the non-operative clinics at the Ophthalmic on Friday and Saturday afternoons, the following 124 eye cases were listed as possibly of interest for exhibition on those days.

This list, which will be greatly extended by the time the clinics are to be held, was made up in a very few days and is published now to give an idea of the varied and interesting cases that may be examined at these clinics:

7	Cases	Strabismus convergens.
1	"	Nystagmus.
1	"	Monocular diplopia.
3	"	Buphthalmus.
2	"	Phthisis Bulbus.
4	"	Atrophia choroidea.
9	"	Choroiditis centralis.
3	"	" disseminata.
4	"	Choroido-retinitis diffusa.
1	"	Coloboma choroidea.
5	"	Sclero-choroiditis posterior.
5	"	Conjunctivitis trachomatosa.
4	"	Keratitis parenchymatosa.
1	"	" punctata profunda.

EDITORIAL.

1	"	Keratoconus.
1	"	Iridocyclitis serosa.
1	"	Hemorrhagia corpus vitreum.
3	"	Opacitates corpus vitreum.
1	"	Synchysis scintillans.
1	"	Glaucoma absolutum.
2	"	" acutum.
3	"	" secundarium.
1	"	" simplex.
1	"	Irido-choroiditis.
3	"	Colomba iridis.
1	"	Aphakia congenitalis.
1	"	Cataracta capsularis traumatica.
2	"	" dura immatura.
10	"	" " matura.
5	"	" " polaris posterior congenitalis.
1	"	Luxatio lentis.
1	"	Hemianopsia.
5	"	Anotio retinae.
7	"	Atrophia nervi optici prima.
1	"	" " " secundaria.
1	"	" " " et retinae.
2	"	Neuroretinitis.
1	"	Papillitis.
3	"	Retinitis albuminurica.
1	"	" centralis senilis.
1	"	" hemorrhagica.
2	"	" pigmentosa.
2	"	" proliferans.
1	"	Amaurotic family idiocy.
1	"	Dacryocystitis catarrhalis acuta.
2	"	" " chronica.
1	"	Stricture ductus lachrymalis.
1	"	Adenoma lachrymal gland.
2	"	Ectropion.
1	"	Redundant tissue lids.
1	"	Lipoma palpebrae.

REQUIREMENTS FOR MEMBERSHIP IN THE O., O. AND L. SOCIETY.

For the benefit of those who are thinking of joining the O., O. and L. Society, the requirements, according to the by-laws, are as follows:

Article V, Section 1. Any reputable physician may be elected to membership in this society who shall have fulfilled one of the following requirements or other qualifications judged by the Board of Censors to be an equivalent:

(a) Not less than one year of service subsequent to graduation as an interne in a reputable hospital or infirmary devoted to treatment of diseases of the eye, ear, nose or throat.

(b) Not less than six months of post-graduate study in these specialties in a reputable teaching institution.

(c) Not less than one year of association in private practice with a reputable practitioner of these specialties. The candidate shall have the endorsement of two reputable physicians from the locality in which he resides.

(d) Not less than three years of independent practice in one or more of these specialties, and the submission of a report of fifty consecutive medical or surgical cases, which shall include histories, treatment and final results. These reports are to be subject to the approval of the Board of Censors.

(e) Evidence of original investigation of a worthy character upon a subject related to these specialties. This material is to be presented in a form suitable for publication by the society in its transactions.

(f) In addition to one of the above, each candidate shall be required to submit a paper on some subject relating to his specialty to the Board of Censors and, if accepted by the board, shall be read before the society by the candidate at the next meeting.

EDITORIAL CHAT.

THE Associate Editor of this issue has taken it upon himself to present certain reading matter which is not usually found in the specialist's magazines. For some reason the great problem of medical education is supposed—by some—to be the legitimate prey of the editors of journals devoted to the field of general medicine. Why this should be so is not clear. So far as we are able to observe, the oculist and aurist is as keenly interested in this subject as anyone can be and is therefore in our judgment entitled to devote an entire issue of his journal, if need be, to the consideration of that which concerns himself as deeply as another. In truth, we believe that by the fact of his specializing he demonstrates a more than ordinary interest in the matter of medical education; a deep desire to reach its fundamentals.

A recent number of *The Medical Times*, of New York, contained an article, entitled "Hahnemann's One Experimental Proof." The author gives evidence in every paragraph of his utter ignorance of Hahnemann's writings, of his methods and the scope of his work. Aside from the fact that Hahnemann made an experiment with quinine, and this he garbled, he knew nothing. He boldly declared that the whole philosophy of "Similia" was based upon this one experiment.

The absurdity of such a position is shown by Dr. Nathan Barbour, in his article found on another page of this number. Dr. Barbour clearly shows that not only did Hahnemann make more than this one experiment, but that all were conducted in strictest accord with the demands of science; and furthermore, that no one has yet been able to prove a single conclusion erroneous once it was stated as definite and scientific. In fact, our strict modern laboratory methods set Hahnemann down as accurate, and the principles he evolved as sound to-day as they were when announced by him.

And while directing attention to the article by Dr. Barbour, which we do simply because it has to do with the great problem of medical education, permit us, for the same reasons, to call attention to the articles by Dr. James W. Ward and Prof. Achille De Giovanni. Here we are given something which challenges the most serious thought of

which we are capable. Here we find something which goes to the very root of the whole matter of medical education.

Dr. Ward points out in his usual clear and concise manner the real place of the homœopathic school in the great scheme of medical training. Some there may be in our school who will disagree with him in his conclusions; but it is doubtful if any will who are at all acquainted with the situation we find ourselves in, or with Hahnemann's ambitions in the early part of last century, or who are entirely free from the prejudice of self interest. If homœopathy is what we claim for it, and if we know as much about the principle as we should, and can present it to a class of students in a clear, comprehensive and scientific manner, not as "homœopathy" but as a scientific therapeutic proposition, then there can be no reasonable fear about the ultimate outcome if given a place in the curriculum of our state universities. The soundness and efficiency of the homœopathic principles have been demonstrated a thousand and more times; but alongside of this, unfortunately, the unsoundness of our understanding and our inefficiency also have been demonstrated many thousands of times.

It is doubtful if any matter has ever been presented to the medical profession which was so deserving of careful consideration and deep study as that which is presented by Prof. De Giovanni. If, as Dr. Cabot says: "The prevention of disease is, as everyone knows, the great hope of medicine," then it behooves us to take up the work so valiantly carried on by Prof. De Giovanni. In his work the two most causative factors, viz., predisposition and susceptibility, are treated as nowhere else in medical literature. His Treatise on Human Morphology, of which the article "Our Program" is really an introduction, we believe will ever remain as a classic. We talk about prevention of disease, and sometimes quite learnedly, yet when we come to analyze the material upon which we base our talk we find that it consists wholly of the *product* of disease—bacteriology, pathology and changes in sensation. Of the facts and conditions which precede these states we know little or nothing, and what is worse are making no very reasonable effort to know anything. Why talk about prevention if we must wait for the products of disease to develop in order that we may have data upon which to found a method of procedure? In our search for preventive and therapeutic measures we proceed almost to a man on the

broad assumption that bacterial findings, pathological states and subjective symptoms are all that we need to concern ourselves about. A great many of us are satisfied with bacterial findings alone. Eighty per cent. of our therapeutic thinking to-day is based entirely upon this narrow and very doubtful phase of the problem. Scarcely ever do we give a thought to the influence of the morphological or temperamental make-up of the individual, either as an element of predisposition or as a modifying factor in the clinical course of a disease. The great need of ever keeping in mind this very important and indispensable phase of investigation in our efforts to establish a scientific therapeutic system, is exactly what Prof. De Giovanni points out.

Much as there is of great achievement in medicine to-day we cannot get away from the fact that there are more people who are skeptical, and openly antagonistic, than there ever have been before. And it must be admitted, too, that this number is not made up of the ignorant and distinctly plebeian classes.

Now, where lies the trouble? In our opinion almost if not wholly in the matter of our ignorance of the human constitution,—by which we mean the morphological or temperamental make-up of the individual. The fact is we know very little or nothing of the absolute and relative development of the various organs and systems found in the human body in the normal; hence, know little or nothing of the modifications in function and reaction in the different individuals because of the difference in development. We treat all as if the functions and the reactions, the predispositions and susceptibilities were the same in all. We seem never to be able to get it into our heads that they are not; and for our folly we are paying dearly. The intelligent layman is probably not able to put his finger upon our weak spot, but that we have one, of that he is certain; and so he, and many thousands like himself seek relief for their ills in other quarters.

P. R.

CABOT'S ARTICLE IN THE NEW YORK JOURNAL.

IN the New York Journal of March 19, 1916, appears a popular article by Dr. Richard C. Cabot, under the caption, "Sees Way to Cut Down the Doctor's Bill." The subject matter of the article does not bear so particularly on this title, but contains some germs of

thought that have already developed and in instances profoundly influenced the practice of medicine. To be fair in judging the worth of Cabot's opinions it is well first to give them verbatim.

"The rich man, for certain reasons, to be explained later on, does not get as satisfactory treatment, by and large, as the free hospital patient."

"Medicine is today far too large and complicated a field for any one man, no matter how wise and experienced, to cover. * * * Therefore we have specialists. But most people suppose that each specialist can do his work for his own part of the body alone in his office and without consultation with his professional brethren in other specialties. This is just where the general public is deceived. All the best trained physicians in the country are keenly aware of the fact that a considerable portion of the patients who visit them present problems which they must solve in part by guesswork, if they have to solve them without the aid of an X-ray plate, a Wassermann test * * * and the advice of those skilled in the various specialties of medicine.

"By a curious combination of ignorance and misinterpretation the general public today still believes that it is a luxury to be able to call a private physician to one's house and a misfortune to go to a hospital as a patient.

"Exactly the opposite is the truth. Those who attend the best of our large public hospitals, free or for trifling fees, are really the aristocrats among the patients. Those who call a physician to their houses or visit him at his office are the unfortunates, doomed to pay high for a relatively poor bit of service.

"Ninety per cent. of all the people of the United States are suffering today because of the bad organization of the medical profession."

Dr. Cabot then describes a system of hiring a doctor by the year, and cites as an example of the plan the system in vogue at the University of California, where each student pays five dollars a year for all medical attention he needs. The sum, he says, is sufficient to support a well paid staff and an efficient hospital. The advantages of the system, as Dr. Cabot sees them, are (1) The treatment and relief of trifling ailments before they become severe; (2) an examination that determines the status of the individual's health and which frequently discovers unknown dangers; (3) the best medical attention; (4) the

small cost; (5) "the group method tempts the doctor to tell the patient the truth," and prevents the "doctor habit" contracted by neurotics. Finally, as "private practice tempts the doctor sorely towards various forms of prevarication and deception," this great danger to our souls is dispensed with.

The article, as a whole, tends to something sensational, and to say the least crystallizes in the mind of the layman who reads it those prejudices and accusations that are so distasteful to the thousands of physicians who are conducting their business honorably and to the best interests of their patients.

Is it true that "the rich man does not get as satisfactory treatment as the free hospital patient?" Recall for an instant the hundreds of cases that you see in the clinic. How many *can* you recall? How carefully are their histories taken in the average clinic unless they are unusual cases? How thorough is the observation and treatment on the crowded clinic day?

It is true that a modern hospital with its different departments *offers* ready facilities for a complete understanding of a case by the aid of its departments. But in our private work do we tend to slight the aid of our friends in other branches when this aid is needed? Is it not to the advantage of the patient and ourselves to refer to the G. U. man or the laboratory man, and do we fear to do this? Dr. Cabot's ideas may have held at a time when the general practitioner could hold his refraction cases, his running ear cases and his tonsil cases; but the people are educated to the truth that Dr. Cabot states, "Medicine is today far too large and complicated a field for any one man, therefore we have specialists."

Are "ninety per cent. of all the people of the United States suffering today because of the bad organization of the medical profession?" Do the majority of the physicians hesitate to help or ask help of others whenever it is needed?

The old question of the contract doctor is brought up in the final suggestions of Dr. Cabot, but now under the revision of "the group system" the ideas *have* been carried out, the instance cited being a good example; and the system is seen in the evolution of the sanatoria, first abroad, then in this country. In towns of large size there is often today a mutual understanding as to the division of work along special lines.

There is, however, a note in the conclusions of Dr. Cabot's argument that is often heard in his writings, a note that should not be allowed to pass unchallenged. "Private practice tempts the doctor sorely toward various forms of prevarication and deception." The inference is that many succumb. This gross untruth cannot be substantiated by the lives and endeavors of thousands of honorable men, known and unknown. Such a general calumny is scarcely due us and is particularly insulting when delivered to laymen. Dr. Cabot's article reiterates the fact that some people are never happy until they are unhappy.

DOUGLAS MACFARLAN.

ASTIGMIA, NOT ASTIGMATISM

NOVEMBER 27, 1801, Thomas Young,¹ physicist and physician, presented before the Royal Society of England his discovery of this physical and physiological condition.

In 1826 John Isaac Hawkins² described his astigmatia and the glasses—crossed cylinders—which rectified it "as described in Dr. Rees' encyclopedia under the article Spectacles." Such glasses were known in France before 1820.

In 1827 Airy,³ The Royal Astronomer of England, described and named his "abnormal" astigmatism—*i. e.*, astigmatia which impairs vision—getting the term from the Rev. Dr. Whewell, who derived it from the Greek *A*, privative, and *stigma*, *atis*, a point, because the focus of such an eye cannot be a point.

In 1874 Dr. S. Weir Mitchell⁴ "was the first to teach the *pathological* significance of eyestrain and its relief with cylindrical glasses. But Dr. Ezra Dyer, Philadelphia, 1861, was the first (Dr. G. M. Gould thinks) to perfect the methods of accurate and scientific diagnosis of astigmatia, and its relief by spectacles, as a daily clinical practice. John McAllister, Philadelphia optician, made in 1828 a pair of spectacles for a Rev. Mr. Goodrich which were planoconcave cylinders.

Dr. George M. Gould⁵ "cannot learn that Dyer had any intellectual conception of the pathological significance of his work."

In 1895 Dr. Georges Martin⁶ called attention to Dr. Whewell's carelessness and showed convincingly that the term designating this ocular condition should be *astigmatia* instead of astigmatism.

The Greek word *stigma* means a sign mark, wound, or point in

the sense of a prick. If the Reverend Doctor had taken the trouble to consult his lexicon thoroughly he would have recommended the term *astigmia* deriving it from *stigme, es*, which means a mathematical point! The proper English word from this should end in—ia, as aphonia is derived from *phone, es*, sound with the alpha privative.

Eminent scholars have testified that the point is well taken.

* * * * *

It is always a difficult thing to uproot an established word in a live language and it would seem particularly so in medicine—that is, to rectify an error.

The disgraceful perversion of meaning of the terms nyctalopia and hemeralopia grew like a weed, so that it is now an immense task to get the profession to realize and always remember the force of the syllable *al* in these words: it comes from the Greek *alaos*, blind, hence nyctalopia properly signifies “night-blind-eye,” (vision disproportionately poor in poor light) and hemeralopia, day-blind-eye (vision worse in bright light).

With others the writer has for twenty years been urging the substitution of *astigmia* for astigmatism. The struggle has been discouraging, but the prospects for this reform are growing brighter. Copeland and Ibershoff’s “Refraction” and Weeks’ “Diseases of the Eye” have adopted it; in neither of these leading text books is the word astigmatism to be once found.

Even with good intention the old term is apt to fall from lips accustomed to it, but when writing there is time to correct such a slip; and particularly this should not be neglected when reading proof.

In common honesty the teacher—in clinic, paper, lecture or book—should be up to date, accurate and scholarly; the students have a right to expect this.

For years the writer, as editor of his State Society’s Transactions, of the JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY, and of the Homœopathic Eye, Ear and Throat Journal, announced that each time he encountered in copy the words astigmatism and astigmatic he would substitute the correct and scholarly terms *astigmia* and *astigmatic*; not once has a writer found fault with him for doing so.

This editorial is written with the hope (now that broken health warns of the end of his usefulness) of inspiring and re-inspiring en-

thusiasm for this reform in all who stand for accuracy and scholarship in ophthalmology. May the banner of this reform be seized and carried by strong hands ever in the van until victory is assured all along the line!

1. *Philosophical Transactions*, 1793, p. 169; 1794, p. 21; 1795, p. 1.
1. Also a *Course of Lectures*, 1807, V. II, p. 575.
2. *Repertory of Patent Inventions* for Dec., 1826.
3. *Transactions Cambridge Philosophical Society*, 1827, II, 267.
4. *Med. and Surg. Reporter*, July 25 and Aug. 1, 1874.
5. *Biographic Clinics*, 1903, p. 182. Whence many of these data were obtained.
6. *Annales d'Oculistique*, 1895, Dec.

J. L. M.

CAUTION—LARYNGOLOGISTS AND RHINOLOGISTS.

IT is not only a nicety but an important precaution against infection that you *form the habit* of wearing a surgeon's mask or veil whenever examining or treating a nose or throat—if you would really carry out, and impress your patients with, surgical thoroughness.

The writer has in mind at the moment two doctors who acquired tuberculosis from careless omission of this simple and readily taken precaution.

One's refined patients will surely appreciate this, and (when you come to think of it) you do not care to take the breath of any patient.

J. L. M.

DEGREES CONFERRED.

Dr. W. C. McKnight, Secretary of the College of the New York Ophthalmic Hospital, reports that on May 12, 1916, the following students received the degree of *Oculi et Auris Chirurgus*:

- Paul H. Gerhardt, M. D., Reading, Pa.
- Irwin Wilson Howard, A. M., M. D., Chicago, Ill.
- Julius Theodore Kane, M. D., New York City.
- John J. McDermott, M. D., New York City.
- Harry E. Koons, A. B., M. D., Danville, Va.

EDITORIAL.

ANNOUNCEMENT.

The editor is pleased to announce that Dr. Gilbert J. Palen, of Philadelphia, will act as Associate Editor for the July number of the JOURNAL.

The Summer Graduate Course in Ophthalmology at the University of Colorado will be given June 19th to July 29. This year it will include a two-hour period, four days in the week, of laboratory work in Histology and Pathology of the eye. There will be a series of lectures on special topics by well-known men in the profession, outside of the Faculty of the University.

The second meeting of the Colorado Ophthalmological Congress will be held in Denver, August first and second, 1916. The program of the Congress can be obtained after June 20th, by application to the Secretary, Dr. Wm. H. Crisp, Metropolitan Building, Denver, Colorado.

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INTRODUCTION TO THE COURSE OF GENERAL MEDICAL CLINIC,
NOVEMBER, 1912.

PROF. ACHILLE DE GIOVANNI, UNIVERSITY OF PADUA, ITALY.

TRANSLATED FROM THE ITALIAN BY EMMELINA DE TH. WALKER, A. B.,
San Francisco.

MANY years ago I began my course by telling of the aspirations in the method of clinical investigations. Led by conceptions derived from the natural history of human beings, I pointed out the necessity which confronts the clinician of discovering, possibly in the most concrete manner, what for ages and by the most illustrious teachers, dealing with the most arduous cases and highly scientific questions, was designated with genial intuition by the words, *Disposition, Individuality*.

And while the clinical investigations and the analyses of pathological phenomena were becoming more and more refined, all the more did the study of the individuality force itself upon me, in order to understand how the general and theoretical concept of the disposition realizes itself in the concrete case.

Thus, after long meditation upon the facts of nature which presented themselves to me from time to time, there came the conception of the method, which I published in 1891 after many proofs and tests.

After many years of experience and observation, conducted with the greatest independence of theories of all kinds, I am more and more convinced of the truth and practicability of the method which has its fundamental basis in the axioms of *Modern Morphology*.

And, let me say, that by this expression I allude to the entire scientific knowledge of natural history, which may be the basis of the Science and Art of Medicine, and I refer to the most recent field of physico-chemical investigations, as to the anatomical, physiological and pathological facts, with which our work has to do.

Everything depends upon our understanding the value of the expression *Modern Morphology*. Many make the word morphology synonymous with anatomy, which is an error. Dealing as we are with

the human being, by the word *Morphology* we mean to allude to facts which represent the degree and the method of the evolution of the being, according to the plasmogenetic possibilities from which he derives his individuality, and that mode of anatomical being, which compels the mind to interpret him, to study his factors, to comprehend his physiological value, the possibilities of his adaptations, functional effort, resistance and morbid disposition. From the morphological make-up we are necessarily led to subtle investigations of physiological chemistry in order to gain an understanding of everything appertaining to the individual plasmogenesis. Unfortunately we cannot yet conduct our investigations far enough and with a method sufficiently rigorous, both scientific and practical, to enable us to understand the origin and the mode of the being of things.

Nevertheless, it must be said that the anatomical make-up is dictated to us by systematic anatomy; while the morphological make-up presents itself to us in the individual whom we make the object of our study, the anatomical frame must be put in relation with all the rest of the organism in order that it may gain biological value and importance.

The anatomical analysis of the human body and the anatomical comparison between the bodies have supplied the elements for the study of anthropology; but whatever the ethnographic type may be which presents itself to us, we must study it from the *morphological viewpoint*, to satisfy the demands of our program, which must lead to the understanding of the *individuality* and of the *predisposition* or of the *individual morbidity*, in accordance with the criteria of evolution, in the naturalistic sense, the ontogenesis, and the laws of biological correlations.

We can thus understand how in our field we cannot give importance to anatomical and anthropological averages, because we must adhere closely to the *individuality* in the anatomical and physiological sense. The morphological examination which I propose to you aims exactly to establish in the concrete case varieties of organization, development, functions and predispositions, if and where they exist.

There are those who, alluding to my initiative in the difficult field of the clinic, have nothing else to say but this: "It has been known for ages that *individuality* and *predisposition* are of great importance. . . ." And with this they believe they bury me in antiquity.

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But it is exactly from antiquity that I come bearing this problem not yet solved, about which I have busied myself, following clear, precise conceptions, dictated by the natural history of beings and making up the fundamental lines of a method of clinical research, which daily experience leads me to believe contributes at least to the knowledge of what for ages, it is said, the clinician ought to remember—Individuality. Consequently, I therefore had reason to expect not just a simple and vain assertion of what everybody knows, but the confutation both of the scientific conceptions and of the method which I propose, before being consigned to the ancients. I had a right to expect as much as the history of science teaches, *i. e.*, the proof of the contrary of what I teach—the demonstration of the vanity of what I have written and repeat to you to-day. Someone has said, and perhaps there is someone who repeats, that you cannot direct the clinic with the tape measure, because I begin to educate you in the morphological trend, making you verify the reality of the fundamental types by means of the use of the tape measure; but you understand quite well that it is only ignorance or bad faith that can attribute to us what I myself have never thought of; while I am thoroughly convinced that the use which we are making and shall make of the tape measure, is nothing but an expedient to which we resort for the exercising of the senses in the observation and verification of the facts which concern us.

But let us abandon these trifles, unworthy of science, and let us affirm that the morphological trend is confirmed more and more every day for the same reason that we understand more and more the interest, the necessity of knowing how to value the part which concerns the individuality, the personal disposition in every clinical contingency. And while, Gentlemen, we witness the development of a new doctrine, that of the internal secretions, we see the multiplication of those facts which demand of us that we classify them according to their value in the series of *individualities* and *predispositions*. I recall in this connection what was very appropriately said by Spolverini concerning certain facts observed by him while studying the noxious influence of the thyroid in pathological conditions upon the nursing child: "In order to explain the observed phenomenon, we must think of an indispensable factor, that is to say, the special predisposition of the subject (the nursing child), without which the determining or occasioning cause (the milk of the goitred woman) would lose all its import-

ance." "But," continues the author, "in what does this predisposition consist? Whence does it come?" If we were to pass in review many other events which are registered in the history of internal secretions, we might frequently repeat the same thought of Spolverini; and the importance of the program which is included in the morphological trend, which according to us must harmonize with the value of scientific facts, never with theories, would appear ever clearer and clearer. And do you know why? Because morphology rises from known and constant facts to the unfolding of other facts, conforming to the Galilean principle, by which the fact explains itself. Therefore do I admit organs of internal secretions, but I do not accept the theories which are offered either on the physiological or the pathological or even on the therapeutical ground, unless we shall first have succeeded through the study of the individuality, in determining in every concrete case the signs, or better the data, which represent to us the different functions of the internal secretions. In this connection also, Prof. Gallerani recently, in his discussion of the influence of pregnancy on tuberculosis, wisely says: "The opinions of authors are and will be divided as long as we speak purely of pregnancy and not of the pregnant woman."

Of course, one who understands the meaning of the phrase *morphological trend* in its scientific and practical signification, does not think of the tape measure, but of the complex and impartial collection of facts which constitute the natural history of the individual, who is the object of our studies: therefore the most complete and exact symptomatic history, which should not only refer to questions of heredity, preceding diseases, the beginning of the present disease and other particulars which the case suggests, but should be the outcome of a true biological inquiry on the precedents of the patient, to understand both how he was born and how he was raised, and among these or those conditions of hygiene, of education; how he withstood the seasonal vicissitudes; whether ruled by particular instincts or special idiosyncrasies, and further how the nervous, cerebral and spinal systems acted in the various contingencies of life. How many considerations of a biological order do we not make during this symptomatic study, by which in so many different ways individuality delineates itself? And how often are we not drawn from these precedents to particular somatic investigations to interpret them and understand their possible

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pathological value? And these premises demand the verification of the morphological data which refer to the modality of the bodily development, to its form, in short, to the fundamental morphological type and to its possible varieties.

All this constitutes the program of our clinical work, which may be extended if need be, and sometimes necessarily so, to other investigations on the blood, on the secretions and on the excretions, with the biological rigour which the case requires.

Many of you can testify that proceeding thus we not only arrived at the pathogenetic concept of the case, but the conception of the therapeutic process came to us spontaneously, and I might say almost of necessity. In this connection I would like to recall to your mind that singular and most important case which came to us from Manchuria. It was a history of syphilis, which relapsed after treatment with the usual means; treated twice with 606 did not improve, and we received the patient in conditions of ever-increasing gravity, owing to many nervous phenomena, among which was paraplegia. You no doubt remember that after our considerations of a morphological order we determined upon a course of treatment which was intended above all to influence the circulatory system and especially the lymphatic circulation. And duly transforming conditions, we saw the cure. No doctrine suggested the treatment, but it was dictated by the individual morphological reasons and considerations.

Thinking of these cases, I cannot understand how Delbet could say that pathology is science and that diagnosis is art. The morphologist is necessarily led to appeal in every undertaking in the clinic to the external and internal anatomy in all its organologic, histologic and cytologic forms and modalities, "and only thus," says Giard, "can he establish the morphological equilibrium in human bodies when it is realized in its perfect forms and in its infinite variants." But when the therapeutic beginning can be determined by concepts dictated by the scientific knowledge of organic facts, it undoubtedly has a scientific inspiration. How frequently have we not seen those remedies fail which had been suggested by empiricism, while those succeeded which we had to adapt to the indications arising from the considerations made concerning the pathogenesis of the concrete case? And to all this correspond other facts which refer to cases in which the therapeutic form-

ula, or the treatment usually advised, is either not tolerated or without effect.

I think that the physician ought always to bear embryogeny in mind, because from this is learned how many varieties of ontogenetic evolution begin, and how these varieties represent the particular attitudes of the forms and singularities of function. I think that the study of *pediatrics* contributes to the increase of this valuable stock of knowledge and to the ever-increasing adaptation of the intellect to the observation and verification of variety in the ontogenetic evolution. And it was this thought that determined me to propose and to uphold, even within the Superior Council of Public Instruction, the establishment of the Pediatric Clinic among us. If there be a place where we can read the errors of evolution, and the possible adaptations, it is in the Pediatric Clinic. And I believe the day will come when we shall study the natural history of the infant to understand the child, the adolescent, etc.

Reflecting upon the facts and the laws which we have mentioned thus far, another thought presents itself to us, which has reference to an idiom which appears in treatises on therapy as well as in those of special medical pathology. In those as well as in these the matter is methodically presented, arranged according to professed doctrines, and possibly explaining some things which are admitted as fundamental, alluding, when necessary, to the *exceptions*. Let us stop awhile on the *exceptions*, especially on those which we meet in the picture of the symptomatology of different diseases. They are particular ways in which symptoms, whether general or local, behave themselves; general, of either the nervous or the circulatory system; local, of this or that organ. Many of these exceptional manifestations are named after an author, who was supposed to be the first to describe them, and not infrequently it appears that to recall the symptom of author A, or of author B, etc., is equivalent to giving it scientific sanction.

I have had to come to the conclusion that we ought to see these phenomenal *exceptions*, or *rarities* gradually disappear, if only everybody would conform to the morphological trend, and through the study of the individuality should find in the individual the reason for the exception, the *quid proprium* of the vitalists. Not infrequently does this happen; the development of the disease is observed and every fact carefully recorded, even the exceptional ones, if they have made an

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impression on the observer; but then some circumstances may arise, accidents in the ulterior trend of things, which fix attention on the exceptional fact, which is then remembered, and sometimes with some comment, referring to a certain clinical meaning which is perceived in the totality of the morbid phenomena. Among those symptoms which are registered by the author's name, I see some that I have made note of and pondered over to understand their value; but being always ruled by the thought of understanding their genesis and biological and clinical value, the indication of them seemed to me superfluous. I mention no names and hope you will appreciate the reason.

The clinician at the patient's bedside has two duties: to verify the morbid form and to interpret it according to the criteria of natural history, to which we have alluded above and which must be substituted for all aprioristic theories. The verification of the morbid form is dictated by daily experience, but the interpretation of the facts, or of the singular phenomena pertaining to the concrete case, must be made by the study of the soil upon which they originate and by the demonstration which may be had of them by the morphological analysis of the facts themselves and applying ever and only the criteria of the evolution of the organism. Humorism, naturism, solidism, vitalism, empiricism, the doctrine of irritability, that of counter stimulus and others still, represent viewpoints from which it was presumed that it was possible to draw the natural reason, the explanation of the facts which were observed; they are artificial lights, which have in some way contributed to the arrangement of the facts in some sort of a way in the midst of darkness; but they no longer have the value of theories which may be called upon to solve what presents itself to us in the patient. Neither the German, nor the French, nor the English, nor yet other schools can impose themselves or can be invoked, because we must all keep close to the facts, and reason about these with the criteria which are dictated to us by the naturalistic method. Some of us sooner, some later, some through genial intuition, some arriving laboriously, must all tread the paths opened by natural history.

However, whatever may be said, Gentlemen, the object of the clinic must be to teach us to be physicians, by illustrating the facts and the empiric phenomena of natural light, and thus contributing to the progress of science. The very history of science has said this, and

it is understood better in our day. In truth, observation and experience of inferior beings throws light upon the biology of the simplest beings; observation and experiment on animals gradually rising higher in degree, points out and explains the morphological and biological facts concerning them; and observation and experiment on Man, always conformably to the laws of evolution, teach us both the human morphology and the human biology. And the experiments which may be carried on on Man are the morbid processes. The canons of general physiology and pathology in clinical observation and experiment, are confirmed and corrected, while by the analysis of the clinical experiences, problems arise for the solution of which it is necessary to traverse again the path of plasmogenesis, phylogenesis and ontogenesis according to the cases.

When I recall that Beneke used to teach that the human machine in the different stages of life has a different constitution, that from these differences arise also different phenomena of morphological adaptation, I am ever more convinced of the necessity of placing before that which is called the objective examination of the patient, the knowledge, possibly exact, of everything which refers to the ontogenesis of the individual and to its morphological variants. I shall say with the illustrious naturalist Vignoli: "The anomalous adaptation of animals to new conditions of life through internal and external modifications of their organism, is a special process of a general law, of universal necessity in the cosmic order and processes of existence."

Impelled by my scientific principles and aspiring to make an application of them even in some social initiative, with great love I raised the alarm against the insidiousness of tuberculosis, endeavouring to demonstrate how predisposition to the disease ought to be verified and how the individuals and the masses ought to provide preventive measures. At the time, it seemed that this great and arduous question must be solved by precepts drawn from the experience of the laboratory; and my small voice, weak and tired, was reduced to silence. But with the passing of the years things changed, and now committees and congresses and the enterprise of benevolent organizations urge the necessity of occupying themselves about scholastic and social reforms, which fully confirm all that was for me the *sine qua non* of a brave fight against the disease. I am exceedingly happy about this, because it solemnly confirms my views about all that concerns the etiology and

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the prophylaxis of tuberculosis; and I trust that the mention of this also will be of some use in demonstrating to you that the fundamental lines of our program are a pure emanation from positive science and directed to so conceive of our Art that it may correspond to its high humanitarian end.

I cannot hide from you that for many years, in spite of the fact that I did not fail to publish the outcome of my observations, I had no encouragement except from my own unprejudiced conscience and from the co-operation of some of my pupils, who honour me to-day, even from the chairs which they worthily occupy: and during this time I frequently made note of the criticisms published regarding my School which they said was only theoretical, and proofs of inexplicable divergencies from it, reaching even to the point of personal insult. The only effect they had on me was to make me stricter with myself in reviewing matters to satisfy my conscience on all occasions and especially when ascending this rostrum as a minister of the most noble Art to which you are called. I shall not hide from you that here and there I have perceived some more or less disguised concept of mine, and even some of my material; and this has given me new courage to persevere in my clinical course, repeating a historical phrase used by the conspirators against the petty tyrants who divided our Italy amongst themselves: "I await the moment."

And to-day, after some favorable acknowledgment of our School, I repeat this phrase in your presence, convinced that events will persuade you too to follow me, conspiring against theoretical tyrannies, which are contrary to the reign of natural doctrines.

HOMŒOPATHY—ITS DISTINCTIVE PLACE IN MEDICINE.

JAMES W. WARD, M. D.,

San Francisco.

“**M**EN of science do not pledge themselves to creeds; they are bound by articles of no sort; there is not a single belief that is not a bounden duty with them to hold with a light hand and to part with it cheerfully the moment it is really proved to be contrary to any fact great or small.”

Professor Huxley has in these words placed the corner-stone for investigation of truth, come from whatever source it may. This would appear the proper line of conduct for the true agnostic in medicine; but to give assent to an obvious truism is one thing, to act up to it another, a greater and totally different thing. “Science is a knowledge of principles or facts, systematized as a distinct field of investigation or again accumulated knowledge which has been formulated with reference to the discovery of a general truth or operation of law.” Furthermore, science is “knowledge classified and made available in work, life or the search for truth.” A science teaches us to know, and an art to do. If these statements be true and the accumulated facts of positive value in regard to drug pathogenesis as displayed in experiments with drugs upon healthy human organisms, together with the application of such knowledge to diseased conditions in accord with the drug picture—then homœopathy may be defined as both a science and an art.

It is upon the threshold of this proposition that the controversy of allopathy and homœopathy has waged for a century. In this essay I shall attempt to *state to what degree homœopathy's claims are justified and open to view the difficulties that beset its universal acceptance*; paving the way to a better understanding of the rightful place of homœopathy in medicine.

If the merits of homœopathy had been calmly received from the standpoint of a demonstrated fact, it would long since have been generally recognized. To claim that denial of such recognition rests

alone upon those with whom we have differed would be to pronounce judgment before the fact.

Primarily Hahnemann's method of ascertaining drug values came as a shock to recognized medicine. It was at once an assault upon the foundations of therapeutics as then known and employed. It came, however, as a message of comfort to the people; as a revolt against the heroic procedures that hitherto had prevailed. In the reaction that followed came the antagonism that rent in twain professional and social relations, developing bitterness that may well everywhere be forgotten.

Nevertheless this very fact has held apart the old and new schools; to the delay of that essential investigation to which sick humanity was entitled.

I. Homœopathy may lay a just claim to recognition because its knowledge is based upon scientific experiments with drugs upon the healthy human prover, the only conceivable way to determine true and specific effects. Based upon his *materia medica* knowledge, Hahnemann sought to apply his therapeutic ideas to the pathological theories of his day and found they did not agree. The pathological views of that era have gone and time has justified his conclusion in having rejected them. As the knowledge of pathology has developed upon a solid foundation as believed to-day, a more exact correspondence exists between pathological findings and drug pathogenesis. By drug pathogenesis is meant a record of all the symptoms observed in the provings of a drug on healthy persons of both sexes. Believing, as I do, that it is greatly for the perpetuity of homœopathy to have also scientific pathological basis, which certainly was not developed by Hahnemann, the future consideration and development of this subject will be required in order to make clear the universal application of Hahnemann's law.

The laboratory experiments upon animals now being practiced are but a sequel of Hahnemann's experimental work performed upon himself eighty-one distinct times in addition to those of his immediate followers. It is a natural outgrowth of his researches based upon his scientific acumen. Note if you please the similarity of method between Hahnemann's experiments and those made to-day in a modern laboratory.

Hahnemann experimented with a single drug at a time upon a healthy human being; the bacteriologist experiments with definite

bacilli upon a healthy animal. Hahnemann began his experiments with drugs taken from the vegetable kingdom; the bacteriologist develops his remedies from bacteria now conceded to belong to the vegetable kingdom. Hahnemann used definite dosage through a certain period to obtain pathogenetic drug effects; the bacteriologist gives a definite dosage hypodermically to obtain a certain symptom-complex or pathological entity. Hahnemann repeated his provings on many individuals; the bacteriologist, on many animals. Hahnemann gave for curative effects the drug whose symptom productions were similar to the diseased state; the bacteriologist gives his serum for a diseased condition based upon the pathological results of the laboratory findings. Hahnemann gave his curative agent singly and in definite dosage; the bacteriologist does the same. Hahnemann gave a smaller dose to cure a diseased state than that needed to produce the pathogenetic symptoms; the bacteriologist gives an extremely small dose of the serum and often waits over long periods before a repetition of the dose in order to note definite reaction through the apyrexia or after period. I submit,—is the latter method more modern or scientific than the former? Both have sought for cure and for immunity.

Without a theory of probable result, small progress would be made in any department of science. Hahnemann likewise theorized but they were always subordinate to his observation of facts. If Hahnemann's theories were found by himself faulty or through later experiments by others, they were eliminated. The intent however experiments by others, they were eliminated. That which stamps fundamentally the method to ascertain drug action by Hahnemann as sound, is that no other method has as yet been devised to contravene the facts determined by his experiments; furthermore, the trend of those researches were directly in keeping with the laboratory methods of 20th century medicine.

II. Again the requirement of science to determine law is that the experiments repeated under same conditions and exactions should produce the same results. The experiments of Hahnemann were oft repeated on himself and others and developed essentially the same observations. I say essentially the same advisedly, because operating through human agencies minor variations of phraseology in description of drug effects are possible while the main symptoms are produced

over and over again, confirming a positive uniform outline of similarity in provings.

In the final analysis of symptom records some variation of expression is possible and the limit of carrying the experimentation in the human has its degree. In animal experimentation the finality may be death and the autopsy develop pathology very extended. Therefore animal experiments may well supplement experiments upon the human, which in a measure they may corroborate. We can never get far removed from the fact that, after all, conclusions reached are for use of the human, and it must be such knowledge chiefly drawn from human experiments as they relate to employment of drugs that must be utilized.

III. The next link in the chain of recognition is that homœopathy consistently systematizes its accumulated knowledge toward the existence and the operation of a law. When Hahnemann published his "Fragmentary Observations Relative to the Positive Powers of Medicine on the Human Body," the first bolt was driven in the superstructure of positive drug effects that were to be methodically arranged to constitute the materia medica of the future. The work was merely an earnest of what was to come. Later the same year he published his celebrated essay called "The Medicine of Experience," and in this essay he details at length how experiments with medical substances are to be conducted in order to ascertain their pathogenetic effects. The sources of this materia medica knowledge are, (a) Experiments on healthy individuals undertaken expressly for the purpose of determining their poisonous effects, with due attention to avoid all circumstances that could vitiate the results obtained; (b) Experiments undertaken by those opposed to the homœopathic system. These experiments were to obtain the physiological effects of drugs although undertaken with the idea of refuting Hahnemann's theory, as those of Jörg and others; (c) The records of poisoning accidental or intentional found throughout medical literature, ancient and modern.

These three sources have chiefly been relied upon for the upbuilding of that superb compilation of drug effects out of which has been constructed the materia medica of the homœopathic school. This has been a task which from Hahnemann's first conception of its necessity must have seemed insurmountable. This has developed a working scheme for arrangement of drug effects, so that many monumental

volumes are at hand for reference, in order to quickly and accurately determine and confirm the choice of the remedy.

IV. Again the inherent features of the systematized knowledge incorporated in the homœopathic materia medica are definite, particular, and present the proven effects of drugs with their characteristics. This is therefore a branch of knowledge with a distinctive mark of quality. Such knowledge applied brings homœopathy forward as a *specialty in medical therapeutics*. This therefore *is its true place*, and as a specialty is capable of giving emphasis to and exact application of accumulated facts to the various branches of medicine and surgery. It is the first correlation of drug effects upon human beings known to the world. This knowledge is not at variance with any other branch of medical learning or rules of general treatment. Applied homœopathy seeks to cure disease by assisting nature in the acquiring of resistance to overcome the internal disorder. It is therefore of fundamental value in practice where functional or organic changes make necessary internal medication or specific drug treatment. It is always of prime importance because selective to the individual; all other treatment is supplemental or secondary to the one central purpose of such internal medication. The homœopathic school does not seek to overthrow traditional medicine, rather it adds its materia medica facts to the sum total of therapeutic knowledge acquired through the centuries. The homœopathic school reveres the worthies in medicine of all time; rejoices in the opportunity of according recognition and shares in all its definite progress.

V. Another definite claim in the support of homœopathy is that the substantiation of a law depends upon its repeated verifications. This is simply the certification of knowledge. It is here that the law of similars has found ample range. Throughout a century applied homœopathy has been practiced in every land, guided by the same law, operating through the same accumulated knowledge of drug analysis and acquired experience to the same verifications of results.

Aconite in the hands of the Herr Hofroth Hahnemann accomplished no more nor less than is possible in the hands of the humblest practitioner wheresoever, if the guidance for its use be the pathogenetic symptoms of aconite. So it is in the use of every known drug. The drug picture must find its counterpart in that of the diseased. To approach now the second part of my subject.

HOMŒOPATHY: ITS DISTINCTIVE PLACE IN MEDICINE.

What are the difficulties that beset its universal acceptance? If we regard the derision of a century towards homœopathy and its adherents; if we estimate the importance of organized old school medicine in this country for the last twenty-five years and then seek to analyze the significance of the intolerant spirit prevailing, we would conclude that homœopathy has a place infinitesimally small and the prospect of universal recognition most remote. This view, however, is but the outward expression of sectarianism, and raises a barrier against that observation. An enlightenment however has been developing among the most advanced and clearest thinkers in American medicine. The most tolerant towards homœopathy of the old school are the most intellectual among them. The least tolerant are men whose intellects have become crystallized at the particular point in development where the possessor becomes entangled in organized interests. It is not easy to divorce self from the influence of education or from traditional opinions. The viewpoint is too near and prevents the lifting of the intellectual horizon beyond the limits of the every-day. This will in a measure at least explain the average medical man's perspective, and the intolerance accorded homœopathy as a school by dominant medicine. As men of science, a larger consideration should naturally have been expected toward the law of similars as a scientific advance. Condemnation preceded any investigation. It was new, therefore not true. It was opposed to their preconceived ideas, therefore false. The researches of Wright, Ehrlich and others, have forced new ideas upon internal medicine which strongly lean towards the truth of Hahnemann's law. Through a rift in the clouds light has been breaking within the last decade on the prejudices of the ages, spreading everywhere a more tolerant attitude and opinion. This spirit of investigation should be received by the homœopathic profession as evidence of the true scientific endeavor of advanced thinkers to experiment and to know. This determination is certainly in the ascendancy. It should be welcomed and cultivated in order that common ground may be found for investigation. The certainty of drug-action must be universally conceded and be capable of analytical and synthetical corroboration. The true scientific spirit must be affirmative in order that a receptivity shall open the way for impartial investigation. In this investigation homœopathy should take the lead. Homœopaths must discourage themselves in order that they may be

strong. It is not in violent assertion of facts that strength is shown, but rather in the detection of where we are weak. In the collection, registration and estimation of symptoms, valuable and necessary though they be, the homœopathic school must avail itself of the next great opportunity to prove the law of similars from the research side of science. The laboratory dedicated to the searching after truth now threatens to rob homœopathy of its birthright. Viewing the matter abstractly, it is illogical to assume that homœopathy has lost prestige by having neglected this opportunity. Upon examination the concrete data of drug pathogenesis has been in itself of vast service. Homœopaths in their special field of work, although omitting laboratory investigation, have produced notable results. It is much to their credit to have studied the art from the side of clinical medicine. Still the burden of proof has been and now is upon us. We must not relax the eternal vigilance needed to meet the laboratory side of the confirmation. While homœopaths have produced vast clinical proof of the existence of law, they have not produced all proof, that is to say, they have not extended researches to show that it really is universal in application. The time has past when a professor in homœopathy can successfully teach without associating herewith special laboratory research work. Clinical verification answers to the synthetical side of the demonstration but laboratory confirmation is absolutely necessary to answer the analytical essentials. Here is our work now and for the future. Light and eyes exist together. As soon as the eyes open they see without acknowledgment. Secrecy and homœopathy are incompatible. Homœopathy boasts of no secrets. She rewards only her votaries who study her resources. A difference of opinion must not be construed as hostility if we reach out for universal recognition. If homœopathy fails to reach its curative values to all diseases as now understood, it should not alone be a matter of criticism, rather of regret. It should stimulate to greater endeavor. In admitting homœopathy into the great current of medicine we must look for endless transformations in homœopathy itself. We may yet see new application of its principles more advanced and more revolutionary than ever homœopathy was toward rational medicine. While additional light may be thrown upon its application, *the law will remain ever unchanged.* Of all medical schools the homœopathic should court investigation and by the substantiation of its claims establish progress. It

should be prepared to give up any belief as soon as further discovery shall show something better. All its principles should receive free discussion like any other specialty of medical science. The moment this is done in general medical literature and accepted as a working rule in daily practice, there will be no further need for a distinctive homœopathic literature. The moment ordinary medical societies shall treat homœopathy calmly as a scientific subject, to be examined into and accepted if proved to be true or rejected if proved to be false, that instant the occasion for our distinctive organization ceases. Homœopaths as scientific men are perfectly willing to unite with their colleagues in investigating fairly and impartially any points of difference of opinion. They are ready to relinquish any tenets as soon as calm investigation proves them untenable. For this homœopaths seek no credit, for with Professor Huxley they hold it to be the duty of all scientific men to act likewise. Homœopathy is not an immutable creed to be professed by all who would qualify. It is not a revelation, for as such it would be perfect and completed knowledge. Rather we rejoice that being a science, it is possible for development to yet unknown proportions. The homœopathic school has always held and now holds to the scientific non-sectarian principle; while boasting of being a school and possessing organization, they deny that they form a sect.

The difference between a school and a sect is obviously divergent. A school exploits what it believes to be truth as long as, but no longer than, known facts support it. It seeks light from every quarter and would cease to deserve its appellation if it refused light from any source whatever. A sect on the contrary stereotypes its knowledge, shuts out the light, refuses to see any adverse facts. Such an attitude belongs not to men of science, but alone to sectarians. Sectarianism is in reality very shallow and delusive. If we desire the law of similars to take the position its greatness deserves, we must divest ourselves of all sectarianism. Progress in therapeutics cannot be made through mere negation. No appeal should be made to the dogmatic teaching of Hahnemann or any other authority as to the truth or falsity in medical practice, unless it stands the test of experience and of reason. We must admit that any possible mode of treatment is worthy of *a priori* attention and to be judged on its own merits. This is all we can possibly ask. It will be necessary to admit that the name

of homœopathy, its separate existence as a school, its societies and periodicals are in the final analysis temporary and caused solely by the sectarian conduct of the old school in denying professional courtesies in the past. This sectarian spirit has until within the last decade established a *locus standi* in medicine to all those practicing homœopathy.

Let us hope that the time is not distant when, by the leavening influence of homœopathy among the body of medical practitioners and their acceptance of it as a working law in practice, the distinctive epithets of homœopathy and allopathy which are sectarian appellations, shall be merged in the one general name of the art of medicine. The curriculum of study of both schools is the same; the sole exception is *materia medica*—all else is identical. Inasmuch as *homœopathy is a specialty* it should be taught and practised as a part of all practical departments in which internal therapeutics may form a part. The central and all absorbing thought in homœopathic ranks must be the revision and extension of the *materia medica* through modern methods and the inreading of laboratory language. This will tax the scientific powers of the school for a generation to come. It is a labor beyond the reach of the few, it must include the work of the many. Again homœopathy must be put to public test in our great hospitals side by side with old school therapeutics as has been inaugurated at the University of California. It is here the real advantage of specific medication will be displayed economically and scientifically. It is in our universities where both methods of practice can be shown, that will ever offer the most convincing proof of the value of homœopathy. This should not awaken any breach of harmony so long as the service is that of scientifically establishing a system of therapeutics for alleviation of suffering humanity. Each school can work overtime and yet fall short of their common ideals. This should ultimately weld the schools for mutual cultivation. This growth of union must necessarily be of slow progress, but in all of this the homœopath's attitude should be conciliatory yet consistent. It need not and should not be that of abandonment of truth as far as we have proven it. We should aim to point out and to convince by experiment and by demonstration its scientific accuracy. The uniform pressure in this direction upon all concerned will allow of free discussion, which is the first step towards the recognition of its values. The medical government of the

world may be a despotism, a constitution, a democracy or lastly, one of freedom. What is therefore our position as men of science and as homœopaths in the universal medical life? We must not make the mistake in thinking that with the general uplift of progress we can quietly settle down. Medicine once a privileged profession is that no longer, rather one of the humanities, and as such is free as the winds, free as only man can be. It is liberal also in the new measures of making the public service stand always first; a liberality which every follower of Hahnemann should emulate. It is not yet time to abandon organization. There are many great innovations now; revolutions within revolutions; blue patches of sky seen only through the thickest and smokiest of our limitations, that many good people believe our world is coming to an end. On the contrary, I very much hope it is approaching a beginning and will soon commence. For hitherto there has been no united world; only separate and discordant nationalities. Nations die in order to make place for others of the world who want all their room but not their company. And so it is with the medical world. The unfriendliness of local and national medical societies seems passing and in a measure a better understanding is dawning. We stand around the cradle of this world's medicine, the cradle in which the great spirits of Hippocrates and Hahnemann were born to observe the light that hovers near. We catch the impression of its godlike nature towards the human race for whom it wears and sheds the expression of universal medical freedom.

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THE SIGNIFICANCE OF EYE SYMPTOMS IN DISEASES OF THE NERVOUS SYSTEM.

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EYE symptoms in diseases of the nervous system are often of such importance in the diagnosis of a case, that without them the physician would be at a loss to accurately determine what the condition is with which he has to deal. Whether in functional or organic disturbances the signs revealed by the eye are many times the deciding factor in the diagnosis as well as in the prognosis and treatment; and hence an acquaintance with ophthalmology is of the greatest service to the neurologist, just as a knowledge of neurology is indispensable to the ophthalmologist.

When beginning the critical examination of a patient who comes to us suffering from some form of nervous trouble, and having observed his general appearance, gait, etc., the eye will then be the first to receive our attention. The appearance of the lid, whether paralyzed or not; the position of the globe, whether it protrudes or not; whether there is strabismus or nystagmus, dilated or contracted pupils or irregularity of the pupils, will all be determined at a glance. Going a little further we will ascertain the pupillary reflexes, and then the action of the extra-ocular muscles. Vision will then be tested, and last of all the interior of the eye will be explored for its evidence in the case.

That we may the better understand our subject let us briefly review the nerve supply of the eye, in order to more readily appreciate the influences which control its functions.

First of all is the optic nerve, which is the special nerve of the sense of sight. It arises from the optic chiasm which is made up of inter-cerebral-commissural fibres which connect the optic thalami of each side; inter-retinal-commissural fibres, and fibres from the optic tracts. The fibres of the outer portion of each tract pass to the optic nerve of the same side, while the central fibers of each tract pass to the optic nerve of the opposite side. The optic tracts arise from the anterior lobes of the corpora quadrigemina, the corpora geniculata

externa, the posterior portion of the optic thalami, and from the cuneus and occipital lobe. Some fibres are detached from the optic tracts and pass through the crus cerebri to the nucleus of the motor oculi.

Second, we have the motor oculi. It supplies the ciliary muscles, the sphincter iridis, the levator palpebræ, and all of the extra-ocular muscles, except the superior oblique and the external rectus. It originates from a nucleus upon the floor of the aqueduct of Sylvius, passing forward through the red nucleus of the tegmentum of the crus cerebri, making its exit on the inner side of the crus and enters the orbit through the sphenoidal fissure.

Third, the patheticus, which supplies the superior oblique muscle; originating in the aqueduct of Sylvius, it winds around the outer side of the crus cerebri and enters the orbit.

Fourth, the abducens, supplying the external rectus. It arises from the floor of the fourth ventricle, emerges from between the pons and the medulla, and passes through the sphenoidal fissure.

Fifth, the sensory nerves of the eye are derived from the nasal branch of the ophthalmic.

Sixth, the sympathetic nervous system is represented by a slender filament from the cavernous plexus to the ciliary ganglion, where it joins the ciliary nerve.

The ciliary fibers of the iris are innervated by the motor oculi, while the radiating fibres are innervated by the sympathetic.

Starr concisely describes the pupil and its muscular mechanism thus: "The action of the pupil to light and to accommodation is a reflex act in which the optic, the motor oculi, and the sympathetic nerves take part. The contraction of the pupil to light is produced by impulses passing from the retina to the corpora quadrigemina anterior; thence to the anterior group of cells in the third nerve nucleus, thence in the third nerve to the ciliary ganglion, from which the short ciliary nerves go to the iris, which contracts by closure of its sphincter. Any lesion which breaks this reflex arc will arrest the contraction of the pupil to light. The dilatation of the pupil in darkness or in distant vision is produced by impulses passing to the dilator pupillæ through the sympathetic nerve from the cilio-spinal centre in the eighth cervical and first dorsal segments of the spinal cord. These spinal centers are connected with the corpora quadrigemina by nerve fibers which pass in the tegmentum of the pons and medulla and in the antero-

lateral columns of the upper cord. The sympathetic nerve fibres leave the spinal cord in the first dorsal nerve root, pass to the superior cervical ganglion, thence in the carotid or cavernous plexus to the Gasserian ganglion of the fifth nerve, and thence by the way of the first branch of the fifth nerve and the long ciliary nerves to the iris. The cilio-spinal centre in the spinal cord receives impulses from many directions, any one of which is capable of producing a dilatation of the pupil. Irritating impulses coming in through the posterior spinal nerve roots, from the skin of the neck, or from any part of the body, may cause such dilatation. Impulses also reach the cilio-spinal centre from the cortex of the brain and from many subcortical centres in the basal ganglia and medulla."

From this general survey of the nerve supply to the eye and the mechanism of pupillary reflexes, we are now able to analyze the meaning of eye-symptoms in nervous diseases.

PTOSIS is such a prominent symptom when present that it would at once attract our attention. It may be temporary when due to weakness of the elevator muscles, resulting from a chronic inflammation of the eye which has necessitated long protection from the light by the closed lid. Sometimes in persons with organic disease of the central nervous system, the upper lid will droop for days or weeks without any other evidence of oculomotor paresis. Atonic ptosis due to an atrophy of the tissues of the lid may occur. The most serious form of ptosis is that due to third nerve paralysis. With it there is dilatation of the pupil and loss of reflex action to both light and accommodation; strabismus divergens and diplopia, accompanied by vertigo and unsteadiness of gait. Third nerve paralysis may be caused by one of many lesions. Lesions upon the base of the brain near the crus, meningitis, tubercular or simple, cerebral abscess or hemorrhages on the base may produce it. Syphilitic exudations upon the base of the brain and syphilitic neuritis are the most common causes. Tumors of the brain, fractures of the base of the skull, may occasionally cause it. But with the symptoms of third nerve palsy, there are also other symptoms present of these various conditions which give us the clue to the diagnosis. Oculomotor paralysis may occur during the course of diphtheria or typhoid fever, and also in multiple neuritis.

STRABISMUS. When the eye turns outward and slightly downward, it is usually due to a third nerve palsy and is caused by the same

conditions which produce the palsy. In cases of cerebral hemorrhage, deviation of the eyes to one side or the other may occur during the coma, but passes away as consciousness returns. It is undoubtedly due to pressure at the base of the brain, producing a temporary third nerve palsy. Internal strabismus is due to a paralysis of the sixth nerve. As the abducens has the longest course of any cranial nerve, it is liable to be involved by disease at any part of the base of the brain, and hence abducens palsy is a frequent symptom of intracranial disease, such as basilar meningitis, syphilis of the base, tumors of the brain, and fractures at the base of the skull. When there is paralysis of the face on the same side as the ocular palsy, and paralysis of the arm and leg of the opposite side, it indicates a lesion in the pons or at the base. Paralysis of the fourth nerve is extremely rare except when associated with a third or sixth nerve affection. When isolated it is usually due to tumor of the cerebellum, or to exudation on the under surface of the anterior lobe of the cerebellum. In a case which recently came under my observation there was paralysis of the left external rectus and right internal rectus, due to a tubercular meningitis. When the child attempted to walk he went to the right side, and the head was turned in the same direction.

NYSTAGMUS, rapid oscillations of the eyeballs, usually horizontal and symmetrical, is a symptom which is often seen, and is due to many causes, such as weakness of the ocular muscles, astigmatism, foreign bodies in the eye, and irritation of the middle ear. True nystagmus occurs frequently in multiple sclerosis and syringomyelia; also in lesions of the cerebellum. It is usually more or less intermittent, and shows considerable variations in the extent and rapidity of the oscillations, which are governed largely by physical or psychical excitation or depression; by sensory stimuli, changes of light, etc. Sometimes it may be developed in one or both eyes when one is occluded. It also occurs in hysteria. Nystagmus is undoubtedly due to a perverted state of the association centres, and not to peripheral lesions of the muscles themselves, and is produced by alternate discharges of motor energy from both sides of the brain.

Dilatation of the pupils may be due to irritation of the cervical sympathetic ganglion or nerve, or it may be due to paralysis of the third cranial nerve. It occurs as a result of direct irritation of the cervical sympathetic by lesions in the cervical enlargement of the

spinal cord, by tumors in the neck, and by excess of carbonic acid in the blood, as in dyspnea, and indirectly by strong emotion, such as pain, anger, fear, etc.; in paralysis of the sphincter pupillæ from such lesions as optic atrophy, glaucoma, also in coma and in cases of increased intra-cranial pressure.

Contraction of the pupils, also, may be irritative, due to irritation of the third nerve or ciliary ganglion; or to paralysis of the cervical sympathetic ganglion or nerve, or may be due to both causes. It occurs in old age, in deep sleep, or on taking certain drugs; from irritation of the third nerve nucleus in the early stages of meningitis, and from hemorrhage into the pons; from paralysis of the sympathetic in disease of the spinal cord, and in syringomyelia.

Unequal pupils occur in many conditions but are of no special diagnostic value.

The examination of the pupillary reflexes is of the utmost importance. Pupillary reaction to light is diminished or lost in lesions of the reflex arc, optic nerve, corpora quadrigemina, motor oculi nucleus, third nerve and ciliary ganglion. When the optic nerve or corpora quadrigemina are involved the consensual reflex cannot be obtained in the healthy eye. The pupillary reaction to light is absent in blindness, deep sleep, narcosis, shock, coma, in epileptic and sometimes in hysterical attacks. It is also absent in tabes, and in many cases of paresis. Pupillary reaction to accommodation is absent in lesions of the third nerve, sometimes after diphtheria, and sometimes in alcoholism. The Argyll-Robertson pupil, where the pupil does not respond to light but does respond to accommodation, occurs in almost all cases of tabes and paresis. In some cases we have the reverse of the Argyll-Robertson pupil, where the pupil responds to light but not to accommodation; this occurs sometimes in diphtheritic paralysis, syphilis, basal meningitis, tumors of the corpora quadrigemina, and myelitis. Immobile pupil may occur in lesions of the optic nerve or tract, in the third nerve, or ciliary ganglion or nerve; it also occurs in tabes, in epilepsy, in hysterics, and in fainting.

In testing the ocular muscles we will determine whether each is able to perform its function or not. If not, we will find whether it be due to a paralysis or spasm of that muscle, or combination of muscles, and then trace back its nerve supply to its proper source, and so determine the cause of the trouble.

Disturbances of vision may be due to a lesion in the cortex of the occipital lobe of the brain, or in the visual tract leading from the eyes to it. The optic nerve leads from the eye to the optic chiasm. We have seen that there was a partial decussation of the optic fibers in the optic chiasm, joining in the optic tract fibers from the corresponding half of both eyes. Thus, cerebral blindness is always a hemianopsia. Homonymous hemianopsia, blindness in the same half of each eye, would indicate a lesion in the optic tract posterior to the chiasm, or the geniculate bodies, the optic thalamus, or near the contralateral calcarine fissure of the occipital lobe. That lesion may be a hemorrhage or softening. A bitemporal hemianopsia of slow onset with choked disk may be due to a tumor compressing the central part of the optic chiasm. A nasal hemianopsia may be due to a tumor compressing the outer part of the optic chiasm on the same side. Bilateral blindness with no lesion in the eye may be due to a lesion or edema of both occipital lobes. Unilateral blindness with no lesion in the eye may be due to a lesion of the optic nerve or chiasm.

In jaundice we have what is called yellow vision, all objects appearing yellow regardless of their color. In neurasthenia and hysteria, red vision may be present as a symptom; while in diseases of the optic nerve and retina there may be green vision. *Muscae volitantes*, irregular spots moving around in the field of vision, occur in neurasthenia, circulatory disturbances in the brain, and in digestive disturbances. Flashes of light appearing and disappearing, may precede a severe headache, or an attack of epilepsy, or be due to circulatory disturbances in the brain.

Achromatopsia, inability to distinguish different colors from one another, may be due to a congenital defect or lesion in any portion of the visual tract, or to defective education. It may be the early stages of a gradually developing blindness or amblyopia.

Last in our examination of the eye, is the exploration of the inner chamber. The conditions which may be the result of brain diseases or diseases of the nervous system, are choked disk, optic neuritis, and optic atrophy.

Choked disk, or edema of the optic nerve, results when fluid accumulates under pressure within the brain, and finds its way into the space between the sheaths surrounding the optic nerve, distending the dural sheath and compressing the nerve at its exit from the eye-

ball. This occurs in tumors and abscesses of the brain, and temporarily after large hemorrhages. It sometimes accompanies Bright's disease.

Optic neuritis may occur without apparent cause; it is frequently hereditary and may go on to complete blindness. It is usually, however, secondary to other causes; toxic elements in the blood, such as alcohol, lead, arsenic, mercury, and tobacco may produce it. It may also occur as a symptom of pernicious anemia, leucocythemia, and diabetes. It may be caused, too, by syphilis, rheumatism, gout, or by taking cold. Its most common cause is from pressure within the skull, exerted either directly by tumor or abscess of the brain, or syphilitic exudations upon the base of the brain, or by pressure of fluids within the ventricles. Much discussion has taken place as to the real cause of the condition in intracranial disease; but it is undoubtedly due to the increase of pressure within the head producing edema of the nerve trunk and a secondary neuritis. This theory would seem to be confirmed by the rapid subsidence of the neuritis as soon as the intracranial pressure is relieved.

Optic atrophy may be produced by many of the same causes which bring on an optic neuritis, being either secondary to the neuritis or occurring by itself. It may occur as a primary affection, without any preceding intracranial pressure or disease. Primary optic atrophy may be associated with other diseases, though it cannot be called secondary to them. This is so in locomotor ataxia, in disseminated lateral sclerosis, multiple sclerosis, and paresis. In all of these diseases the optic atrophy is a very serious complication and is probably due to the same cause which produces the original trouble. In locomotor ataxia ten per cent. of the cases begin with optic atrophy. In multiple sclerosis about half of the cases develop this condition. Optic atrophy may occur as the result of poisoning by tobacco, alcohol, lead, and quinine.

In this short paper I have simply been able to touch upon the main symptoms of the eye, as manifested in diseases of the nervous system, a sort of review, as it were, to refresh our minds in the everyday hurry of active life. It is my opinion, however, that far more attention should be given to the study of the eye in its relation to diseases of the nervous system by both the ophthalmologist and neurologist than is usually the case. I also firmly believe that if they would consult more frequently in regard to their cases much more benefit would be derived by the patients,—with greater satisfaction to the specialists.

HOMŒOPATHY AND THE QUININE EXPERIMENT.

NATHAN POWELL BARBOUR, M. D.,
Lockford, California.

RECENTLY there has appeared in a prominent medical journal of the United States the allegation that Hahnemann, in formulating his law of "similia similibus curentur," based his conclusions upon a single experiment, namely, the historic quinine experiment. This is so obviously a mistake that one wonders that such an error could still persist in this day of scientific accuracy, even in matters of history. For the open pages of history lie before us all, presenting an array of facts that stamps Hahnemann as one of the most conservative of investigators, cautious in drawing conclusions, and far more scientific than his contemporaries in all of his investigations and studies. It is true that Hahnemann in his early investigations made mistakes, but in the maze of the medical and scientific inaccuracies of his day he could not escape them. The law of similars persists to-day, unaltered during a hundred years of kaleidoscopic changes in medicine.

It was in the year 1810 that Hahnemann wrote the *Organon*, in which he definitely set forth the new law of cure. It was the product of twenty years of thought and experiment. As early as 1790 Hahnemann made the so-called "quinine experiment." But, did he go on record at once as a discoverer of a new law in medicine? He certainly did not. The experiment was published but the homœopathic law was not definitely announced until years later.

Hahnemann was a prolific writer. In the medical journals of his time there appeared constantly articles from his pen. If these articles are arranged in their order of appearance we can trace quite definitely the development of Hahnemann's idea of drug therapy from the time of his "quinine experiment" in 1790 to the "*Organon*" in 1810. And it is this record of his writings and his work that so effectually proves that Hahnemann's law of similars was the product of years of experi-

ment and study and not a wild assumption, or a "house of cards built upon sand" as some would have us believe.

A man's publications indicate the extent and amount of his investigations. How many of us know the number of pages that Hahnemann published before 1810, the date of the appearance of the *Organon*? Of translations in medicine, he published five thousand, five hundred and eleven pages; of translations in science there were four thousand, two hundred and ninety-five,—making a total in translations of nearly ten thousand pages! Nor were these ordinary translations. Hahnemann made numerous corrections in the text and added notes that not only enhanced the value of the original work but in many instances these notes were declared by the foremost men of his day to be more valuable than the work itself. Of Hahnemann's original articles written before 1810, there were about four thousand pages devoted to medicine and science. His work on Chemistry displayed methods of chemical technique of an exactness and refinement unknown in his day. It was Hahnemann who first discovered and announced the principle of the separation of the so-called "acid hydrogen sulphide" group of metals from other metals. This method of separation is to-day the most important principle in qualitative analysis, and yet during a course of lectures in the history of chemistry at one of our large universities, not once did I hear Hahnemann's name mentioned in connection with this monumental piece of work.

Perhaps Hahnemann was not justified in stating his convictions to the world after he had accomplished the enormous amount of work which enabled him to publish fourteen thousand pages of translations and original articles! Perhaps he was hasty in announcing his theory when his contemporaries used such phrases as the following in alluding to his work: "Hahnemann, whom chemistry has to thank for many important discoveries" (Professor Gottling); "In examining the work more closely we find very much new and important matter, and every page shows that the well informed author (Hahnemann) speaks from experience." (Professor Trommsdorf.) If, as some would still have us believe, "this house of cards was built upon sand," it must be obvious that these cards were built of an exceptional material and that the foundation of sand was cemented together with the most astonishing amount of work and experiment that the world has ever seen.

I cannot close without observing that since Hahnemann's time, his

work has been carried on, that his conclusions have been verified thousands of times, and that through the last century of changing medical isms and hobbies the principle of "similia similibus curentur" stands to-day as firm as Gibraltar, unshaken by, and sometimes even amused at, the various eddies and currents around it.

JOHN WYLLIE, M. D., Sc. D., Edin., F. R. C. P. Edin. Emer. Prof. Med., University of Edinburgh.

Dr. Wyllie at the ripe old age of 72 years has passed away after a life of great usefulness as a student of our science and as a teacher. He discharged the duties of professorship of medicine at Edinburgh University until 1914, when his health first failed.

In 1894 he published his great work on Disorders of Speech, which is to-day a milestone in the development of this subject. "The book contains the first clear enunciation of the share which the laryngeal mechanism takes in the act of whispering."

As a teacher his ability to express lucidly and forcibly his ideas made his lectures models of conciseness and penetration. He was beloved alike for his ability and for his great human sympathy.

D. M.

BACTERIOLOGY IN CONJUNCTION WITH HOMŒOPATHIC PRESCRIBING.

WALTER W. IRVING, M. D.,
Los Angeles, Cal.

AFTER having been out of active medical work for nearly ten years, and only having gotten back into it within the past year, I am somewhat out of touch with recent medical literature. Possibly what I am about to offer is an old story; but if so, no harm will have been done in repeating it. The idea has been placed before two or three men, and they knew of no articles along the same line.

During the past eight months I have done considerable bacteriological work, the object of which was to ascertain the micro-organism causing the infection in nose, throat and ear cases coming to us for treatment, and thereby determine the kind of vaccine to be given.

It is now recognized that in at least all acute morbid conditions there is some micro-organism causing the trouble, and cultures and the microscope are the vehicles with which to determine the species. My observation of the vaccine treatment is that the results, as a whole, are indifferently positive. Some cases respond promptly, while in others the treatment is long drawn out or absolutely negative. As much can be accomplished with the well-directed homœopathic remedy as with the vaccine, but it requires a closer study of one's materia medica to make intelligent selection of that remedy.

The administered vaccine is supposed to work as a non-resisting irritant and stimulates the anti-body function of the cell tissue to assist nature in throwing off disease. My understanding of the action of the administered homœopathic remedy is much the same as the theory of the vaccines, in that it stimulates the body-tissues to greater resistance, allowing nature to resume its functional balance. Or, does the remedy stimulate the "anti-body function," or does it act as a germicide?

It is positively known that the *Spirocheta pallida* or *Treponema pallidum* is the cause of syphilis. Arsenicum is claimed to be directly germicidal to that micro-organism, hence salvarsan, and in the primary

stages of that disease it seems to work wonders. In the later stages mercury is still the remedy of remedies, and there is no question as to its homœopathicity to lues. Why cannot the same germicidal function be attributed to other drugs in their application to other micro-organisms? That gelsemium has a direct action in the early stages of influenza, belladonna in scarlet fever, pulsatilla in measles, goes without comment.

In the acute stage of otitis media, belladonna, plantago or some like drug is best suited to the case. Later hepar sulphur, tellurium, silicea or some deeper acting drug may be indicated. The micro-organism found in that disease may be the micro-coccus catarrhalis, influenza, pyocyanus or pneumo-bacillus, pneumo-staphylo- or streptococcus, or a mixture of two or more of them. Take for instance the more common staphylococcic infection of that disease. Does belladonna, if indicated, act as a germicide in the early stage? In the less acute stage, when actual suppuration has taken place and the same micro-organism is present, does hepar sulphur, if indicated, act as a germicide if it clears up the case?

To make a thorough investigation into this subject cultures will have to be made from cases coming under our care and the micro-organism determined. With this a record would be made giving a complete history of the infection, date of inception, virulence, the temperamental characteristics of the individual, the remedy prescribed, why it seemed best indicated, and the result. As the case progresses, if a change of remedy becomes advisable a fresh culture should be made, and any change in the micro-organism or its virulence noted.

By compiling a series of cases and in that way unifying the micro-organism with the remedy, a materia medica can be produced that has a foundation acceptable to all schools of practice. It would be another "keynote" aid in selecting the remedy. By utilizing the material at hand in a large eye, ear, nose and throat clinic, much useful data can be compiled. Anyone who possesses a microscope and an incubator can add much from the standpoint of the private practice.

Personally, I shall keep a record of all cases coming under my observation, where the homœopathic remedy is prescribed.

Later, I hope to write something more definite than just an idea, for I have been able to demonstrate the practicability of the course outlined, but not sufficiently to give positive data.

702 Title Insurance Building.

THE VALUE OF THE SPARK FROM A HIGH FREQUENCY MACHINE.

PHILIP RICE, M. D.,
San Francisco.

ABOUT six years ago I invested in my first high frequency machine. Nothing did I know about its workings at the time or the effects of the various currents I was able to take from it, and even now I cannot lay claim to having very great knowledge. But I determined to learn something useful about high frequency electricity, and in due time I was rewarded among other things with a knowledge of the spark and its usefulness in a number of trying conditions.

Some few months after I began to study and experiment, a lady was brought to my office totally blind from pannus. Trachoma was my diagnosis at the first glance. She had had the trouble six years, and, like Job, had suffered much from many physicians.

Examination revealed a severe case of vernal catarrh. This had become chronic; it was as severe at one time of the year as at another. The excrescences were of unusual size besides being unusually tough in character, the result of caustics and cuttings. Both eyes were equally affected. The pannus covered the whole cornea. Upon learning in whose hands she had been I at once concluded that all the usual methods of treatment had been applied, and that if I was to be more successful I must go outside them.

A few weeks before a patient whom I had refracted incidentally complained of a sore middle finger—sore from a corn right on the tip. Being a professional 'cellist it interfered greatly with his playing. Having tried many things without success I offered to try something absolutely new. He submitted to the application of the spark from the high frequency machine, with the result that in a few days he lifted the whole growth right out, ultimately leaving a perfectly normal finger tip.

This encouraged me to try the spark on the fungi of the lid of my vernal catarrh patient.

The first time I applied it I used cocaine. Being distressed by the cocaine, she suggested the next time she came that I try it without. This I did, and though there was some pain it was not at all intense, and so I made all subsequent treatments without it.

Improvement began almost at once. The pannus cleared up entirely, vision became normal, and though it required weekly treatments for several months and an occasional treatment for two years the result is apparently permanent.

These two experiences led me to try it in certain tonsil defects, and with very gratifying results. Not infrequently do we meet with cases of chronic tonsillar trouble that can hardly be classed as a surgical condition, and others that really require surgical treatment yet the patient refuses to submit to it. The latter cases suggested to me the use of the electric spark. How the thing works, that is what the process is by which something like a normal if not an absolutely normal state is brought about, I do not pretend to be able to say. But I have seen extremely large, and apparently genuine hyperplastic tonsils shrink to normal size in half a dozen treatments. I have seen large crypts—crypts habitually filled with caseous matter—contract and give no further trouble. With care the treatment can be given with very little inconvenience to the patient. My method is to bring an insulated wire—tip exposed—close to the tonsil and then have an assistant “cut in” the switch for a few seconds. Four or five applications are made in this manner to each tonsil at each sitting. Very rarely is there any special reaction after the treatment. A sense of roughness for a few hours is all that is ever complained of. Usually a week is allowed between treatments.

Physicians' Building.

A PROCEDURE FOR ENLARGING THE INFERIOR MEATUS.

THE inferior turbinated bone projects from the superior maxilla at an angle which varies in different individuals. When the angle is large the bone juts out toward the septum in a manner which is obstructive to the lumen of the nostril. This obstructive condition is augmented when the membrane itself is hypertrophied or turgescient. The latter condition is easily reduced but when based upon a projecting turb the breathing room is still restricted. The following procedure will be found effective in this case. After cocaineization and depletion with adrenalin a narrow saw is introduced and the turbinated bone sawn through or nearly through horizontally near its attachment to the maxilla. The saw cut is made upon the exposed side of the bone. The saw is then withdrawn and some blunt instrument is introduced. I have found a large Hajek separator effective for this purpose. With this instrument applied to the lower edge of the turb, pressure is made outward so that the bone breaks along the line of the saw cut. The cut in the membrane is then cauterized to prevent bleeding and a pack is introduced at the bottom of the nostril to hold the turb in its new position. It is not necessary to pack the whole nostril. This low pack should be renewed daily for a week to prevent the bone returning to its former position.

The obvious advantage of this procedure is that the breathing room of the nose is increased with a minimum of tissue destroyed.

FRANCIS B. KELLOGG.

Los Angeles.

PATHOLOGY OF GLAUCOMA (*Continued*).

G. W. MACKENZIE, M. D., AND FRANK O. NAGLE, M. D.,

Philadelphia.

Among the changes that may be found in the tissues of the eye as the result of glaucoma may be mentioned:

Those in the cornea are mostly secondary and include: Edema of the epithelial layer as manifested by swelling of the epithelial cells due to imbibition of fluid. Occasionally the cells swell to such an extent that they burst and are lost, causing a break in the surface which



FIG. 17.—Demonstrates edematous swelling of corneal epithelium—one of the causes of rainbow colors.

Partial closure of angle of anterior chamber.

leaves tiny excavations. Edema causes a widening of the intercellular canals (the normal space between the epithelial cells) due to the presence of fluid. In still other cases the fluid between the cells may gravitate toward Bowman's membrane and collect and form vesicles between the basal cells and Bowman's membrane.

Salzmann attributes the dull reflex of the cornea in glaucoma to the edema.

Fluids may also be found in the stroma of the cornea.

Degenerative pannus found in the cornea in cases of glaucoma involve the epithelial layer and the deeper structures. Degenerative pannus usually commences in islands and dips down from the epithelial layer into the superficial layers of the corneal stroma. In large areas of pannus we find a corresponding area where Bowman's membrane has disappeared.

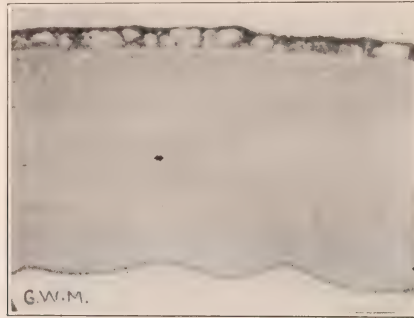


FIG. 18.—Edema of the corneal epithelium—high magnification.

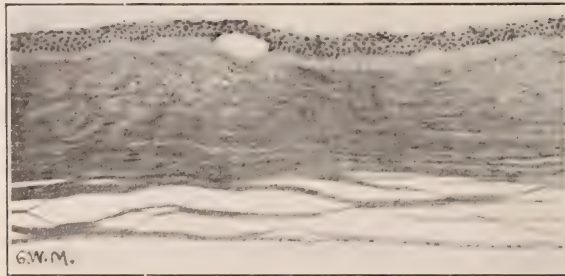


FIG. 19.—Glaucoma Absolutum, *Coloboma artificialis iridis*. *Vesicles on the Cornea.*

Cornea showing vesicles between the epithelium and Bowman's membrane. These vesicles are related to infiltration of the epithelium with fluids and the increase of fluid with widened intercellular canal system, conditions which are frequently found in glaucoma.

Xerosis of the corneal epithelium, found in one of the specimens, Fig. 23, is a change that belongs to ophthalmia from any cause, including pronounced hydrophthalmus. Late in glaucoma we are likely to find hyaline degeneration in the stroma, shown in Fig. 24. In congenital glaucoma, which is always secondary, according to Salzmann, the coats of the eye stretch either uniformly throughout, when we recognize the condition as hydrophthalmia or buphthalmia, or in parts when we recognize the condition as ecstasia or staphyloma. The more

frequent and direct cause for ecstasia of the cornea is wounds of cornea from injury or perforating ulcers followed by secondary glaucoma.

A staphyloma of the corneo-scleral junction but not including the ciliary body is known as staphyloma intercalary. When the ciliary

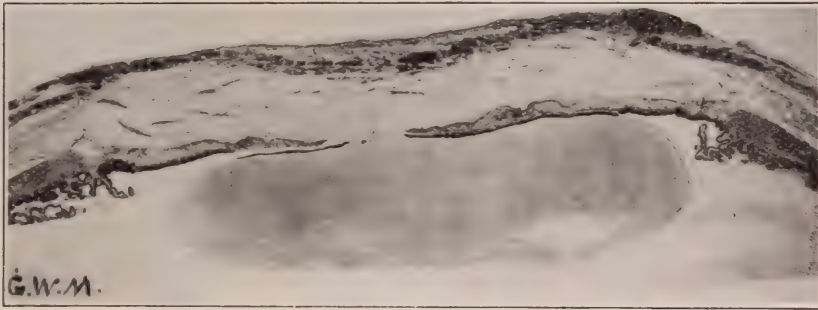


FIG. 20.—Regressive type of corneal ulcer with flattening of epithelium and almost obliteration of the anterior chamber.

There is almost complete absence of the anterior chamber; iris is attached to the posterior surface of the cornea and the lens is close against the iris. There is a pannus-like formation in the cornea whereby cicatricial tissue replaces Bowman's membrane.

body alone is involved the condition is known as a staphyloma ciliary; this latter condition is generally found in combination with the preceding.

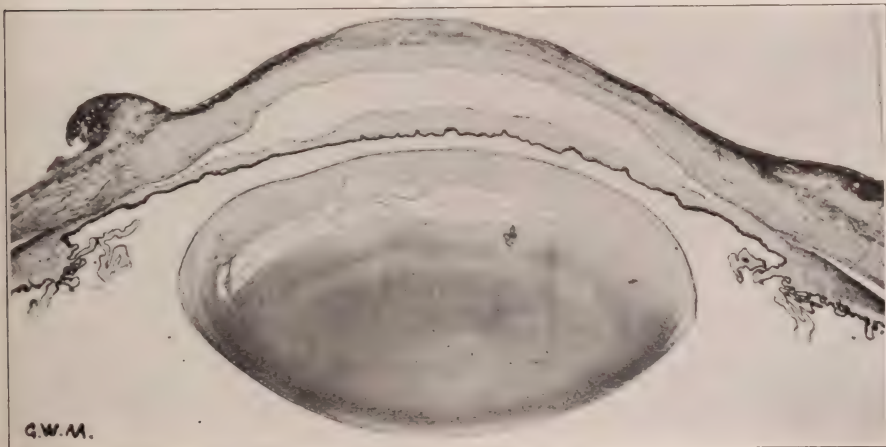


FIG. 21.—Pannus, Secondary Glaucoma and Cataract following Carcinoma of Lid.

There was a keratitis. Cornea is thinned in part. Lens shows many spaces (cataract of anterior layers) due to lack of nourishment.

The changes in the anterior chamber found in glaucoma are quite uniform in character, but may vary in degree. The chamber is more

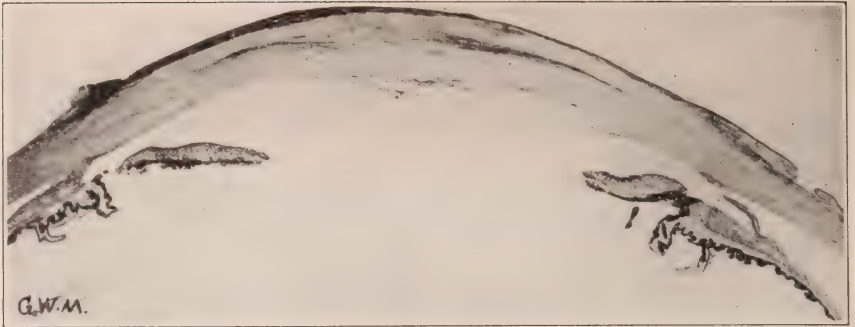


FIG. 22.—Absolute Glaucoma with Pannus.

There is granulation tissue in front of Bowman's membrane and in other places holes are shown in Bowman's membrane where the infiltration has penetrated deeper into the corneal stroma. Numerous blood vessels are in this infiltration.

That there are places where the epithelium is in contact with Bowman's membrane and other places where Bowman's membrane is absent because of the infiltration, is characteristic of Glaucomatous Pannus, *i. e.*, islands of granulation tissue starting in several places.

The separation of the iris and ciliary body is artificial due to the shrinking of the tissues in the hardening fluid.



FIG. 23.—Xerosis of Cornea. Secondary glaucoma and hemorrhage.

The corneal epithelium is greatly thickened and resembles more or less the stratified epithelium of the skin surface. Xerosis of the cornea results from exposure to air, and in this case was due to incomplete closure of the lids from chronic lagophthalmus.

Peripheral synechia is present with glaucoma. Iridectomy was performed without results.

Lens is cataractous. Circumferential space is enlarged indicating hydrophthalmus.

or less narrowed, especially toward the angle, due to a peripheral synechia which is present except in extremely rare cases. As a matter of precaution it is well to study many sections in a glaucomatous eye before arriving at the conclusion that peripheral synechia does not exist, for it may not be shown in the one section and be quite pronounced in another more distant one.



FIG. 24.—Shows hyaline degeneration of the cornea.

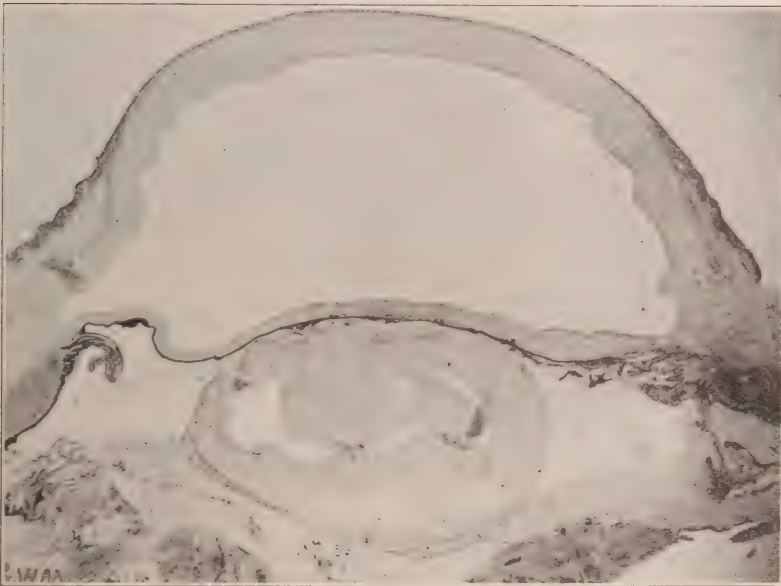


FIG. 25.—Iridocyclitis plastica after hydrophthalmus.

We have in this case a peripheral synechia, especially noticeable on the left side. The pectonate ligament is condensed with no spaces between. The condition is frequently found in hydrophthalmus. The anterior chamber is deep because of the stretching of the cornea which shared in the general enlargement of the eyeball. There is scar tissue in the cornea which gives the impression of advancement of the subconjunctival tissue onto the cornea beyond its normal limits. The lens is cataractous as shown by the wrinkling or folding of the anterior capsule, which is an evidence of shrinking of the lens substance. Unfortunately a part of the lens has dropped out of the specimen in the process of mounting.

Peripheral synechia and excavation of the nerve-head are the two most constant and characteristic anatomical findings that occur in glaucoma of primary or secondary origin. In the average case the adhesion extends the whole distance of the pectinate ligament and is combined with atrophy of the iris. Eventually the atrophy becomes so pronounced in the area of the adhesion that little is left of the iris except the pigment epithelium. In still other cases, for instance those following perforating wounds of the cornea, nearly or quite the whole extent of the iris is plastered against the posterior surface of the cornea and quite atrophic.

Obliteration of Schlemm's canal is indicated by the absence of endothelium. It is a characteristic finding in all cases of late glaucoma from any cause.

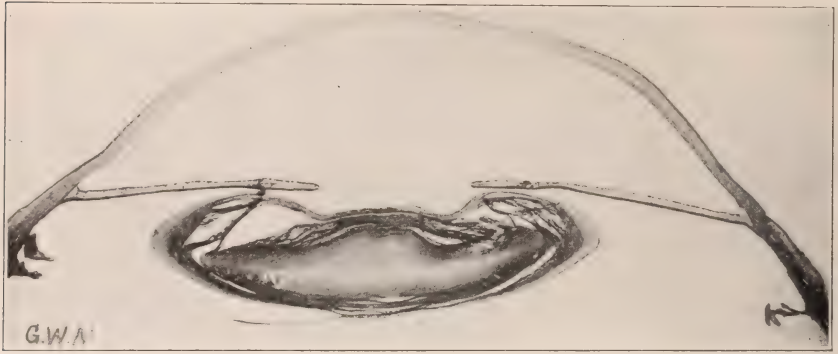


FIG. 26.—Hydrophthalmus.

Eyeball enlarged in all diameters. Cornea much enlarged and thinned; however curvature differed but little from normal as measured by the ophthalmometer. Of all parts of the cornea the limbus was most enlarged.

A pronounced peripheral synechia. The opaque portion of limbus of cornea measures 4 to 5 mm. whereas in normal should measure 1 mm.

The great distance between lens and ciliary body shows enlargement of cornea. Iris is atrophic but fairly regular in structure. Ciliary body shows atrophy.

The portion of iris adherent to sclera shows only pigment epithelium; there is no trace of the iris stroma.

High magnification shows traces of pigment in pectonate ligament.

Changes in the iris are quite characteristic in late cases of glaucoma. They are essentially those of atrophy. The iris appears quite compact as compared with the normal.

Atrophy of the iris takes place in the pigment of the stroma cells and cells forming the anterior limiting layer of the iris (anterior layer). The loss of the pigment is responsible for the ashen color of the iris that occurs late in glaucoma. The atrophy of the iris is due

largely to the compression of blood vessels in the peripheral part of the iris. According to Salzmann there is less atrophy of the connective tissue than there is a condensation of the tissue. This sclerosis is one of the causes of dilatation of the pupil seen late in glaucoma.

In cases of inflammatory glaucoma a layer of cicatricial tissue forms on the anterior surface of the iris. It tends to form straight, flat cells, which tug on the pupil margin and cause eversion of the pigment epithelium. In some cases the pigment epithelium is everted over one-third or more of the anterior surface of the iris.

Other changes may be found in the iris, but they are less the result of the glaucoma than they are a cause. Among these may be mentioned posterior synechias, partial or complete, in some cases associated

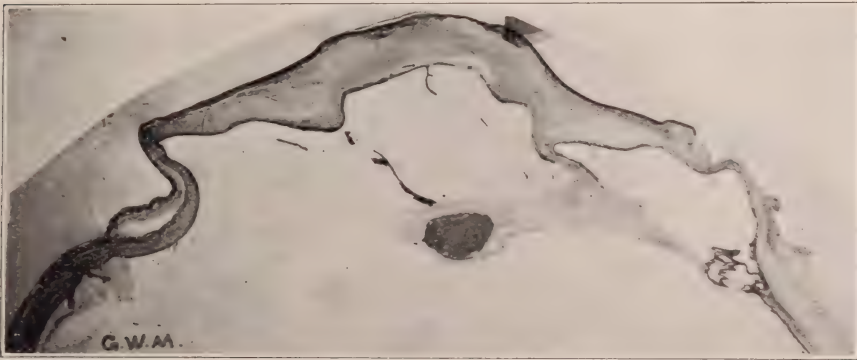


FIG. 27.—Staphyloma cornea and Intercalare with aphakia and crystal wulst.

There is no true corneal tissue here, but only cicatricial tissue which sprung from the iris: There is epithelium on the anterior surface and pigment epithelium of the iris on the posterior surface. There is an absence of Bowman's and Decemet's membrane. In the scar tissue, examined by the microscope, there are some unstriped muscle fibres of the iris, which were not entirely destroyed by the cicatricial tissue. In this specimen there is also a crystal wulst of the German authors. That there is ectasia in this case is distinct evidence that there must have been a plus tension.

with a pupillary membrane. In other cases we may find granulomatous infiltrations which bear a causal relationship to the glaucoma.

Changes in the ciliary body are usually those of atrophy similar to that found in the iris and just referred to. In all cases of glaucoma of long standing the ciliary body appears to be considerably shrunken. See Fig. 26.

In the early cases of simple glaucoma a swelling of the ciliary body may be noted. This is due to congestion and not to actual inflammation, as pointed out by Salzmann, who has failed to observe the char-

acteristic findings of inflammation, notably the round-celled infiltration that belongs to inflammation. Not infrequently the anterior process of the ciliary body is adherent to the posterior surface of the iris, and so blended together that the one is lost into the other.

Changes in the position of the lens is to be noted in secondary glaucoma, indicating their causal bearing to the disease and noted elsewhere. In the cortical substance of the lens there may occur changes secondary to glaucoma. These changes usually take on the form of cataract, the result of interference with nutrition.

On the other hand, the swelling of the lens, especially when sudden and excessive, as sometimes happens in cataract, may be an active cause of glaucoma; so that without a history it may be puzzling to decide from a specimen alone which of the two factors was primary

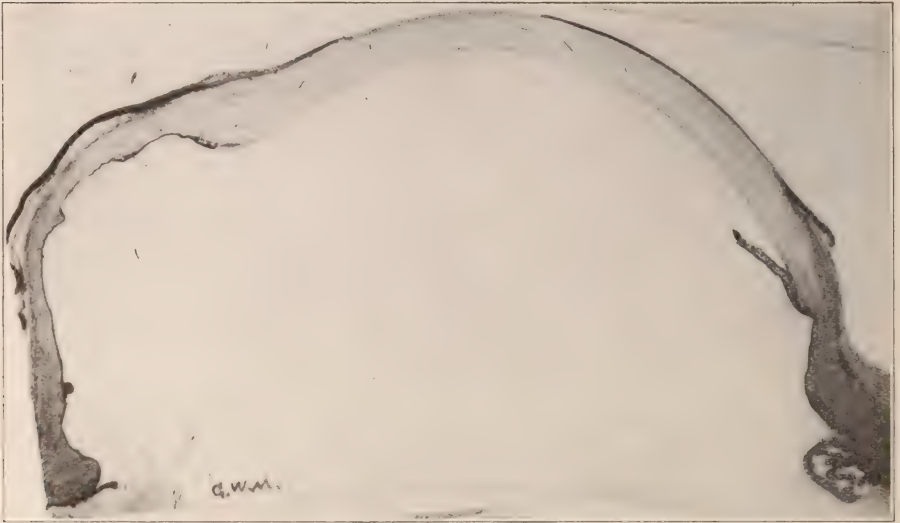


FIG. 28.—Intercalary Staphyloma.

This eye was injured by a stone two months before enucleation. The staphyloma extended over one-half of the cornea. On the posterior surface of the staphyloma is the ciliary body and anterior surface of the iris. On the other side is an adherence of the iris and only a trace of the staphyloma. The case also showed luxation of the lens and a deep glaucomatous excavation.

and which secondary. In the figure (21) showing this combination the cataract was secondary to the glaucoma.

The changes in the choroid are comparable with those found in the iris and ciliary body. The elements are compressed and atrophic, making the choroid quite thin. The inner layer suffers most in the process; the chorio-capillaris fails to nourish the pigment layer and

as a result the pigment is lost, especially about the optic nerve, when a pallor is produced and recognized as ophthalmus, especially the glaucomatous halo.



FIG. 29.—Staphyloma Sclerae.

Equatorial staphyloma of sclera; observe that sclera in ectatic portion is thinned. This circumscribed thinning of the sclera is characteristic of ectasia and is the feature that distinguishes this condition from Hydrophthalmus where there is a uniform stretching of the sclera throughout its entirety.

Bulging of the sclera can be noted to correspond with that portion which is thinned. The bulging would be more apparent if it were not for the fold that is present.

This specimen is from an eyeball with advanced and long-standing secondary glaucoma.

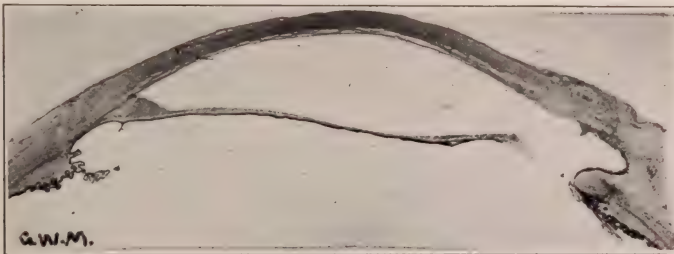


FIG. 30.—Glaucoma Absolutum, Coloboma artificialis irides. Vesicles on the Cornea.

Was operated a few months before enucleation for glaucoma without results. Operation followed by prolapse of one pillar of coloboma causing slight ectasia.

Lower margin of iris is pulled upward and held there by cicatricial tissue which shows but faintly in specimen. Root of iris is adherent. Iridectomy failed to separate the adhesions.

There are vesicles on the cornea which show better in higher magnification —see Figure 19.

Aphakia was present before operation for glaucoma.

This absence of pigmentation is quite apparent in Fig. 35.

Changes in the retina are principally those of atrophy; the retina is compressed and the circulation more or less interfered with, with the result that atrophy occurs. Since the outer layers are nourished by the chorio-capillaris they suffer from loss of nutrition. We may

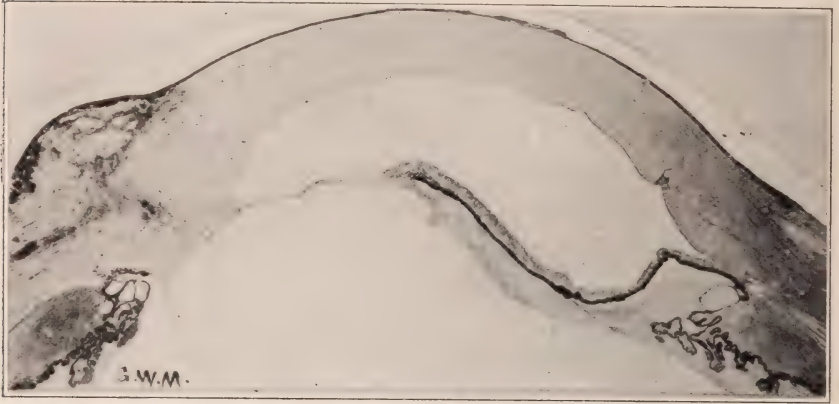


FIG. 31.—Glaucoma with Iridectomy followed by rupture of the capsule and loss of lens substance. The region of the iris shows signs of inflammation. Notice the membrane going from the margin of the pupil to the wound on the left side which filled out the pupil and the coloboma. The membrane was due to organization of the exudate. Iris tissue is condensed and therefore the peripheral synechia must have been present before operation.

Specimen also shows a cyst in the ciliary body just behind the root of the iris.



FIG. 32.—Secondary Glaucoma.
Typical glaucomatous cup in a hydrophthalmus eye.

find more or less congestion of the choroid in the early cases of so-called inflammatory glaucoma.

Because of compression the retinal circulation is interfered with so that we find a cause of atrophy in the remaining layers of the retina.

PATHOLOGY OF GLAUCOMA.

As a result of atrophy of the nerve itself there naturally follows a subsequent degeneration of the nerve fibre layer.

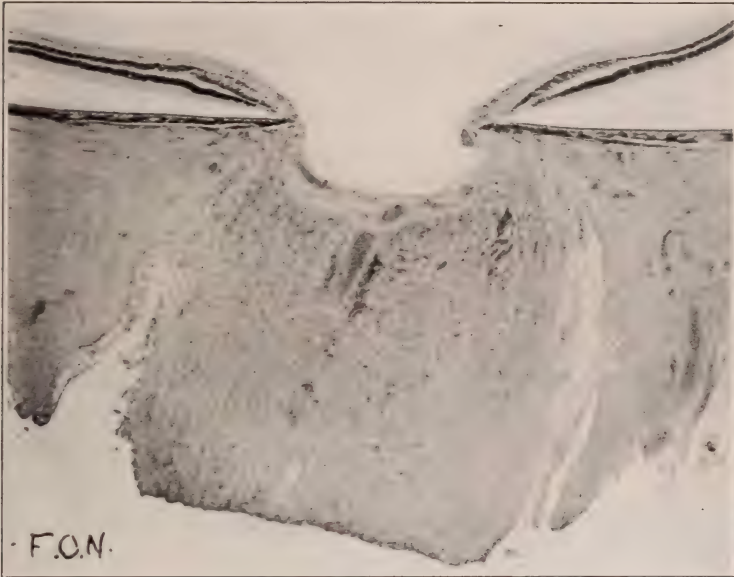


FIG. 33.—Glaucomatous Excavation. Detail of picture shows interstitial proliferation of nerve fibers behind excavation.

As a result of all these influences the retina becomes quite thin and atrophic in all cases of advanced glaucoma.



FIG. 34.—Hydrophthalmus excavatio glaucomatosa.
Shows typical glaucomatous excavation with dislocation of lamina cribrosa backward.

Horizontal section.

The changes in the optic nerve are characteristically those of atrophy with pronounced cupping. The atrophy of the nerve is so pronounced that it tends to pull the nerve fibre layer of the retina into the cup. As a result of the pressure the lamina cribrosa, which is modified thinned sclera, is pushed backward (so-called backward dislocation). The lamina cribrosa may be so far dislocated that it extends posteriorly beyond the sclera.

A further cause of the atrophy of the nerve is attributed by some to a secondary degeneration following the loss of the ganglion cells of the retina. In some cases it may be a question as to which of these two conditions preceded the other.



FIG. 35.—Atrophy of the optic nerve with glaucomatous halo.

The particular feature brought out in this specimen is the loss of the pigment epithelium of the choroid, which is responsible for the glaucomatous halo seen by the ophthalmoscope.

Concerning the changes in the sclera they have already been referred to incidentally when speaking of the changes in the cornea. The sclera may become stretched as a whole with the rest of the eye in case of buphthalmia, or in part when we refer to it as a staphyloma. These changes in the sclera occur following glaucoma in early life but not in later adult life.

So-called staphyloma posticum does not belong to the subject of glaucoma; the cause is not exactly known. It is the essential factor in the cause of malignant myopia.

PATHOLOGY OF GLAUCOMA.

Other changes in the eye might have been mentioned but they do not belong strictly to glaucoma but rather to associated phenomena. Some of these conditions may be seen in the several illustrations.

The illustrations exhibited in this paper are from photographs made with the able assistance of Mr. Herman Walters, of Philadelphia, to whom we owe many thanks. The photographs were taken mostly from microscopic slides made by the writers while doing post-graduate work in the European clinics. Unfortunately the same opportunities are not offered in this country even to those willing to do the work.

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THE ADVANTAGES OF THE FISHER DOUBLE LID HOOK.

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WHILE enjoying the benefits of a visit to a clinic conducted by a friend I saw a patient of a type known to us all, and the behavior of her eyelids while the eye was undergoing a superficial examination forcibly recalled to my mind a variety of experiences. As the practiced hand of the examiner approached the left eye, a clonic blepharospasm occurred which seemed to be beyond the control of the patient. Although all the examiner wished was a view of the cornea and the patient knew it, it required the use of both thumbs to separate the lids sufficiently to permit a superficial examination of the eye. All of us have seen just such patients and some of us have operated the same type for cataract and have seen the operation ruined in the twinkling of an eye by the spasmodic contraction of the orbicularis after the operation was completed or even while the speculum was in place.

This particular patient had had an operation upon the right eye some time previous to my visit, and after the completion thereof the spasm of the lid-muscle had ruined the eyeball, suddenly forcing out the vitreous, and now a shrivelled stump was present. The second eye (left) had been successfully operated in spite of the spasm.

We are all taught the wisdom of removing the speculum after the cataract incision has been made and the advantage of holding the lids apart with the fingers while the lens is removed, but the Fisher double hook, which was introduced to make the Major Smith operation a safer procedure, has accomplished the purpose of the introducer and will surely find a much wider field.

This double hook is not to be confused with the single instrument which is intended to retract the lower lid. One end is fashioned for a retractor but the other end has two long blunt prongs and is the most valuable portion of the instrument.

The use of this double-end hook will make the various cataract

THE ADVANTAGES OF THE FISHER DOUBLE LID HOOK.

operations of all kinds safer and do much to avert the danger in cases of patients who cannot control the blepharospasm spoken of above.

I have used the instrument in eight or ten Smith operations and am satisfied that its use in that operation is imperative, but it is of its use in other fields that I wish to speak now.

Recently another oculist friend operated a patient of the type spoken of, and after the cataract incision was done the power of the muscular fibres of the eyelid was sufficient to bend the speculum and ruin the eye, and all so quickly that nothing could be done to prevent further damage. The damaged eye was removed and, as a result of the rotation of service in the hospital, the patient came into other hands for operation upon the second eye.

Warned by the previous operator's experience preparations were made to avoid the repetition of the accident. A preliminary iridectomy was done and the patient placed upon a diet to reduce the plethora, and it became my privilege to assist in the operation and have the opportunity of testing the efficiency of the Fisher hook.

The expected blepharospasm occurred, but the hook was introduced beneath the upper lid, the lid pulled away from the eye and the lower lid retracted by my thumb. There ensued a tug-of-war until the muscle was fatigued by steady traction. The incision was made and the lens removed without trouble, in spite of the engorged conjunctival vessels which bled freely where the forceps held. The patient made an uneventful recovery and I firmly believe we would not have been able to control the lids by any other method.

The long double prongs permit control of the deeper and more peripheral fibres of the orbicularis palpebrarum and make it possible to pull the upper lid *away* from the eye.

It would seem desirable to use this instrument in all kinds of cataract operations and avoid the use of the speculum entirely. The Gronholm spoon (or the American substitute for it) is more suitable for examining the superior fornix, but the hook will be of great assistance in other operative procedures about the eye when it is necessary to see well up under the upper lid, as in replacing the flap after the Elliot trephine or suturing the flap as is sometimes necessary. The speculum separates the eyelids; the hook and the finger will do this and in addition hold the upper lid away from the eyeball. While

the speculum is in place the peripheral fibres of the sphincter muscle do act, as we unfortunately know.

Years ago, Dr. Liebold performed cataract operations without the speculum, depending upon the fingers of a trained assistant. His judgment in this respect cannot be questioned, but we can not always have a trained assistant. If the holding fingers become moist or the skin surfaces of the eyelids wet, there is danger of slipping. The hook does not slip, it holds the deeper muscle fibres away from the eyeball and the hand holding the hook is out of the way. To be sure the great majority of our cataract patients are tractable and behave finely during the operation, but the occasional difficult case is the case which we must study to raise our percentage of successes. The hook should be the usual instrument and not reserved for the expected difficult case, because there is only one way to become thoroughly acquainted with an instrument and that is by use. Experience with it will demonstrate that accidents are avoided and that peculiar uneasiness which one feels in times of stress when his instruments are new to him will not mar the difficult case.

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THE RELATION OF TONSILS TO GENERAL DISEASE AND THEIR EXTIRPATION.

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IN a paper of this scope it is impossible to give more than a cursory review, as so much has been written on this subject very recently that an exhaustive consideration would require a formidable treatise.

Yet, in spite of all the current discussion, a great many general practitioners fail to give the subject the attention it deserves, and apparently consider the whole matter a case of ultra-enthusiasm of the specialists and consequently to be taken not too seriously; and because of this attitude the specialist has been slow to speak and very careful and conservative in his claims.

Several men who enjoy the confidence of the entire profession have declared that the tonsil is of greater clinical importance than the appendix, and that it causes more suffering and more deaths. If this is true the tonsil should have the most careful consideration and searching investigation.

In September, 1914, Dr. Frank Billings, who is not a throat specialist, but who is doing research work at Rush College and the Presbyterian Hospital, Chicago, published an article on focal infection in the A. M. A. Journal, giving the results of the team work of Billings, Davis, Jackson, and Rosenow. It was shown conclusively that focal infection is the chief etiological factor in rheumatism, arthritis, endocarditis, myositis, myocarditis, various septicæmias, tuberculosis, nephritis, visceral degenerations, some types of thyroiditis, pancreatitis—with or without glycosuria, peptic, gastric, and duodenal ulcers, and cholecystitis.

A very recent writer, Andrews, of Toronto, claims that appendicitis should be added to the list.

Regarding goiter, Billings says: "These reports aroused the interest of the clinic as to the possibility of focal infection as a cause of

goiter. The following case-reports are interesting and seem to show that there is an infectious type, with and without symptoms of exophthalmic goiter, which seems to be of focal origin. The rapid subsidence of goiter and the symptoms after removal of the foci of infection in the jaws and tonsils was a surprise."

He then gives reports of seven cases of goiter—of which five were exophthalmic—that made rapid recoveries upon removal of the tonsils.

Billings says, furthermore: "The usual site (of focal infection) is in the head, in the form of alveolar abscess, deep tonsillar, or peritonsillar abscess, and chronic sinusitis."

Other papers along the same lines have followed, confirming and establishing the original conclusions and showing that the tonsil is usually the offending organ.

The report of more recent experiments by Rosenow and Davis, published in the *A. M. A. Journal* of April 16, 1916, shows that infections of the ovaries are carried to those structures by the blood more often than is supposed; that the disease comes from distant focal infection, and that the tonsil may be the offending organ.

For some time, previous to the appearance of these papers, it has been charged that tonsils as foci of infection cause many general diseases, especially rheumatism and endocarditis.

Robertson, at the Chicago Polyclinic, has been studying this matter for some years, and claims to have done the first original work along this line. He teaches that thirty per cent. of all acute, and ninety per cent. of all chronic rheumatisms have their origin in the tonsils, and that the remaining ten per cent. of the chronics come either from pyorrhœa or trouble in the lower bowel.

There are no data immediately available to prove or disprove the correctness of these figures, but it is significant that an institution like the Chicago Polyclinic should stand behind such an unqualified statement. Whether or not these figures are accurate it is certainly true that a large number of cases arise from tonsil infection, as it has been recognized for more than twenty years that there is a very close relationship between the tonsils and rheumatism.

A brief survey of the anatomy of the tonsil and its physiological connections shows very clearly the reason for such a relationship.

Each tonsil has from eight to twenty crypts, usually straight, but sometimes tortuous, that extend through the follicular tissue to the

capsule. They open on the surface in puncture-like orifices covered with epithelium. Bacteria are absorbed through the cryptic epithelium in sufficient numbers to cause marked disturbances, and the crypts become incubators of streptococci and staphylococci and centers of infection.

The outer aspect of the tonsil is subjected to compression at each act of deglutition through its attachment to the superior constrictor muscle of the pharynx. The anterior and posterior pillars, between which it lies, contain the palatoglossus and palatopharyngeus muscles, respectively, which compress the tonsil.

It may be noted here, incidentally, that because of the close relationship of the posterior pillar to the eustachian tube an enlarged tonsil may cause tension upon the eustachian orifice, an inflamed one promote degeneration of the palatal muscles, or an adherent one interfere with the muscular movements and contribute to the collapse of the tube; and all result in disturbance in the ventilation and drainage of the middle ear, so that deafness results and a condition is produced in which tonsillar micro-organisms may find a fertile field for aural infection. However, the relation of the tonsils to ear troubles is not as intimate as that of adenoids.

So we have an organ with open tubules lying in a bed of muscle that subjects it to compression. A number of authorities claim that this muscle-compression forces food and bacteria into the crypts rather than out of them. But regardless of the exact method the crypts often become filled with fragments of food, staphylococci, streptococci, and debris, making them clinically the source of local and constitutional disturbance.

There is no mystery as to the process by which such an infection affects distant organs; a glance at a picture of the lymphatic system makes it so plain that there is no occasion for theorizing. The tonsillar lymphatics drain into the deep cervical chain under the sternocleido-mastoid muscle, then to the thoracic duct from which infection may be carried to any part of the body. In this way an infected tonsil, filled with the products of putrefaction, pus, and bacteria, may pour a constant stream of poison into the general circulation and infect almost any organ in the body. This is not a fine-spun theory, but simple, elementary anatomy and physiology.

Furthermore, besides itself being the direct source of infection,

it may become the atrium of extraneous infection, and there is already an extensive literature proving this point.

It is generally admitted that often in tubercular processes the tonsil is the portal of infection, but just what percentage can not be stated definitely. From four to ten per cent. of the tonsils removed and examined show tubercular lesions.

It is probable, according to Ballenger, that suppurating lymphatic glands of the neck are usually due to the entrance of the infecting organism through the tonsil. That such infections are not secondary to the lungs as some have believed, is proved by the fact that such cases are rarely found in phthisical subjects.

It is very probable that latent tuberculosis may exist in the tonsil without presenting any clinical signs. Out of ninety-six guinea-pigs that Dieulafoy inoculated with pieces of tonsils and adenoids fifteen developed tuberculosis.

Williams says that primary tuberculosis of the tonsil is less rare than is generally supposed and results in tuberculosis of the cervical glands so commonly seen in weakly children.

Dawson advocates the theory that scarlet fever has its primary lesion in the tonsil and Kocher shows that acute osteo-myelitis may be due to the same cause.

The writer has seen a few cases of aggravated iritis that had resisted all the usual remedial measures make very marked improvement within six hours after removal of the tonsils, and then continue to rapid and uncomplicated recovery.

In urging removal of the tonsils the question of their function and effect upon human economy always arises, but even those who have protested the loudest against their ablation, for fear of interfering with their function, have been totally unable to point out that function.

Attempts have been made—but with doubtful success—to show that the tonsils have a protective function against micro-organisms. On this subject Williams says: "If the tonsils are in some measure a protection this protective power is limited, and when the power is passed they are a positive source of danger." Such a protective function has never been proven.

Some writers have claimed that the tonsil has an internal secretion, but no one has ever been able to demonstrate it.

It is quite widely believed that the tonsils have a pre-natal func-

tion and at birth, or very soon after, that function ceases. But whether this be true or not it is certain today that the tonsils have no known function—unless it be the incubation of infection and the dissemination of general disease. It is also certain that their complete removal has no deleterious effects whatever.

Ballenger says: "The patient is entitled to immunity from tonsillar infection if it can be established without seriously jeopardizing either his health or his life. When the tonsil becomes a well established atrium of infection the physical economy of the patient is constantly menaced by conditions ranging all the way from follicular tonsillitis to endocarditis and pulmonary tuberculosis. Measures should therefore be adopted which will insure future freedom from infection through the tonsil."

He further states that during the past ten years he has attempted the removal of five thousand cases and, barring about a dozen with minor complications, he has seen no unfortunate results.

We know clinically that when a tonsil has become infected the patient's health and life are conserved by its entire removal in the capsule.

Tonsillotomies, cauterizations—thermic or chemical, opening the crypts, and various other surgical methods have proved themselves inadequate. If a tonsil is diseased it should be removed, root and branch, and there is no more reason for leaving a piece of tonsil than a part of the appendix after an appendectomy and, as a prominent surgeon remarked a few years ago, that the knowledge of the presence of an appendix was an indication for its removal, so trouble sufficient to call attention to the tonsil is an indication for its complete ablation. When the capsule is included there can be no possibility of recurrence, as often happens in mere tonsillotomies.

The diagnosis of a diseased tonsil is not always so simple as it might appear, as its size is of only ordinary importance, for it must be remembered and carefully noted, that diseased tonsils do not always stand out beyond the pillars, and that a perfectly normal tonsil can neither be seen nor felt. Many lie flat and hidden behind the anterior pillar and oftentimes a small buried tonsil—the "submerged"—causes more trouble than the hypertrophied; frequently such a tonsil, apparently normal, will exude pus upon pressure or its diseased aspect will become manifest by catching it "upon the gag."

Upon examination of practically one thousand throats at the Chicago Eye, Ear, Nose, and Throat Hospital the writer failed to find a single pair of normal, healthy tonsils, but a false inference must not be drawn because every case was seeking relief from some ear, nose or throat trouble; but a large majority, however, were totally unconscious of any tonsillar trouble and the fact remains that diseased tonsils are exceedingly common.

The relation of the tonsils to the singing voice and the probable results upon the voice of their removal are, in many cases, questions of far-reaching importance, and positive and definite answers and assurances are demanded of the physician.

It is certain that diseased tonsils definitely impair the voice. As the tonsil is wedged between the palatoglossus and palatopharyngeus muscles forming the pillars, any swelling to cause tension upon these muscles, or any inflammatory adhesions binding them down, must necessarily impair their function of co-ordinating with the muscles of the soft palate and thus impair the vocal resonance.

Ballenger is authority for the statement that the annoying sub-acute laryngitis in singers and speakers is often the result of absorption of septic matter from the tonsils, and that the trouble is remedied by the removal of the tonsils; Maxwell makes practically the same statement regarding chronic follicular pharyngitis.

The first and immediate effect of tonsillar ablation is to relax the pillars so that they often fail to perform their function and the effect is detrimental to the voice; but after a few weeks they become attached to the new fibrous tissue formed in the sinus tonsillaris, take on new tonicity, and perform their function better than ever before.

Sir Morrell Mackenzie is authority for the positive statement that he has never seen any other than beneficial effects to the voice follow removal, and Ballenger and others endorse, repeat, and confirm the assertion.

The physician may then assure his patient with perfect confidence that nothing but good can come to the voice as the result of a properly performed tonsillectomy.

In addition to some of the objections that have been advanced to tonsillar ablation—and found wanting—the cry of “mutilation” is sometimes raised. The basis and justice of such a cry, as well as its answer, was typically illustrated at a western medical meeting several

years ago. A member, after delivering his argument, exhibited a clinical series of "terrible examples," with some of the worst mutilations imaginable. Dr. Oliver Tydings inspected them all carefully and remarked that they were not samples at all of tonsillectomies, but of *pharyngotomies*.

The work of crude, clumsy, and incompetent operators can be no argument against any properly performed operation.

So far no argument yet offered against the careful ablation of a diseased tonsil, with its capsule, has been able to stand against the cold acid test of analysis.

Apparently there are almost as many varieties of operation as there are operators, and as many types of snares and ecraseurs. One man dissects the tonsil from the pillars with sharp scissors—and the men in his clinic have labelled it the "submarine" because it is so bloody; another (Boetcher) ligates the arteries in every case with his fingers, and he is one of a very few whose fingers are so constructed that he is able to do so; others, after a small incision, dissect with the dull edge of scissors—and do very neat and effective work; others use the short-shanked right-angled knife to dissect; some after an initial incision dissect with the finger; and all use the type of snare or ecraseur that appeals to them personally; some do no dissecting at all, removing the tonsil with the ecraseur alone.

All these apparently different methods are essentially very similar and might be classified under two general heads—the method of Tydings, consisting of dissection and snare, and the method of Sluder, who uses the ecraseur alone without any dissection. Details of further methods or the choice of instruments are largely matters of mere personal choice and taste.

Each general method has its own strong advocates and each accomplishes the result desired—the complete ablation of the tonsil in its capsule—to the entire satisfaction of everybody concerned.

To determine if either method has any distinct advantages, the Cook County Hospital made careful comparative tests of the Sluder and Tydings methods over a considerable period of time, and it was found in the comparison that the Sluder method suffered to the extent of fifteen per cent. in torn tonsillar pillars.

Every operator should choose that method which best appears to him to accomplish the removal of the entire tonsil with its capsule,

and does so with the least risk of injury to the anatomical structures of the patient; and, finally, to avoid the pitfalls of dangerous radicalism, or unthinking faddism it must be remembered always that the removal of a healthy tonsil, merely because it is a tonsil, is an inexcusable act.

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THE DIAGNOSIS OF ACUTE MAXILLARY SINUSITIS.

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IN looking about for a subject suitable for a twenty-minute paper to be read before a society composed mostly of general practitioners, I selected that of Acute Maxillary Sinusitis for the reason that inflammation of the accessory sinuses is a frequent complication of acute rhinitis; that of the several sinuses the maxillary is the most frequently involved; that the general practitioner is the one who sees these cases first; that when early recognized he can do a great deal alone or better in conjunction with the specialist toward the cure of the average acute attack, the amelioration of what might otherwise prove to be a severe attack and the prevention of chronic maxillary sinusitis.

With the limited time at my disposal I shall refer very briefly to the anatomy of the maxillary sinus. It is the largest of the nasal accessory sinuses, pyramidal in shape and located within the superior maxilla. The base of the pyramid forms the major portion of the outer wall of the nasal cavity. The apex is located in the region of the malar bone or, more exactly speaking, at the junction of the malar with the maxillary bone. It has an anterior wall almost square; an outer wall more or less triangular-shaped which may extend into the malar bone; a posterior or zygomatic wall; a superior wall which forms at the same time the floor of the orbit, and a proximal or nasal wall quadrangular in shape. The nasal wall is the most important, for it contains the natural ostium of the sinus; besides it is the wall which we attack in making our diagnostic puncture and in applying treatment.

The floor of the sinus is somewhat triangular in shape, uneven because of the presence of the roots of the teeth, which project more or less into the cavity.

The maxillary sinus is irregular in size and form in different individuals and in the same individual at different periods of life, since it grows larger from birth to old age by a continuous process of resorp-

tion of bone. In fact, it may vary in size and form on the two sides in the same individual,

According to Cryer, "The development of the sinus (maxillary) begins about the fourth month of gestation by an invagination of the lining-membrane of the nose from the hiatus semilunaris into the body of the maxilla. From the time of the invagination until the eruption of the permanent teeth the greater portion of the maxilla is occupied by the dental organs.

As a result of the continuous process of resorption the sinus walls may become exceedingly thin in old age, in some instances to such an extent that dehiscences may result after the same manner as in the case of the temporal bone.

Because of its importance from the clinical and therapeutic standpoint a brief description of the nasal wall of the sinus is permissible. It is quite vertical and slightly convex; the lower edge bends outward to form the floor; rarely does it bend inward toward the palate to form a palatal pocket. The ostium is a sort of isthmus which connects the maxillary sinus with the nasal cavity. It is round or oval-shaped, and is situated along the upper margin of the inner wall of the sinus, somewhat anteriorly, and passes in a slanting direction upward and medianward into the hiatus semilunaris. Accessory ostia are occasionally met with somewhat lower, and posteriorly to the natural opening in the pars membranacea.

The pars membranacea is that portion of the inner wall of the sinus which is composed of two layers of mucous membrane only—one of the sinus and the other of the lateral nasal wall and is therefore, because of the absence of bone, the thinnest and most yielding part of the wall.

It is situated between the bulla of the ethmoid above, the inferior turbinate and the uncinate process in front and below and the vertical plate of the palatine bone behind.

The natural ostium of the sinus drains into the hiatus semilunaris, which is a sort of trough extending from above and in front from the ostium of the frontal sinus in a curved direction posteriorly and downward, and terminates at a point about the middle of the lateral wall of the nasal cavity. The convexity of the hiatus is directed downward and forward. The depth of the hiatus depends upon the size of the process uncinatus.

THE DIAGNOSIS OF ACUTE MAXILLARY SINUSITIS.

The mucous membrane lining the sinus resembles very much that of the respiratory portion of the nasal cavity; however, much thinner. It blends with the periosteum covering the underlying bone. This muco-periosteum contains mucous glands and the surface is covered with ciliated epithelium.

The causes of sinusitis may be divided into the predisposing and the actuating. The predisposing causes are chiefly those of a mechanical nature, to wit: Anything that may cause an obstruction or a tendency to obstruction to the proper ventilation of the sinus; for instance, septal deflections even of moderate degree; enlarged, cystic or excessively scrolled middle turbinate, even though covered with normal mucous membrane. However, when the mucous membrane of the middle turbinate or uncinate process is hyperplastic the tendency to obstruction is increased. In some cases the predisposing cause may be found in combination of these several factors when one alone might be insufficient.

The actuating cause is some infection capable of producing a rhinitis. The micrococcus catarrhalis, pneumococcus, influenza bacillus, Klebs-Löffler bacillus, streptococcus, and staphylococcus are among the more common infecting micro-organisms.

As contributing causes may be mentioned the patient's susceptibility to a particular micro-organism, his general lowered resistance which makes him more vulnerable to all harmful influences (including infections) and which impedes his vital force in making prompt repairs. Many of these factors, although very important and interesting, cannot be considered because of the limited time, and besides they belong as much (if not more) to the realm of general medicine as they do to the specialty of rhinology. Lest it be overlooked I might add that the presence of enlarged and diseased tonsils and adenoids and obstructive conditions in the nose, no matter of what nature, tend to lower the patient's vitality and make him more susceptible to diseases in general and rhinitis in particular. If we rhinologists are willing to concede that general systemic disturbances produce an increased susceptibility to rhino-pathologic conditions, then we have a right to ask the internist to accept our conviction that rhino-pathologic conditions produce general systemic disturbances.

The symptoms and signs of maxillary sinus disease as I find them are as follows:

History of a recent cold in the head. mild, moderate or severe. The

more severe the rhinitis the greater the possibility of a complicating sinusitis developing. Furthermore, the more severe the infection the earlier the sinusitis is likely to develop. However, quite a large percentage of cases develop sinusitis late after the primary infection in the nose has begun to abate. In these cases we usually get a history of an extra exposure. For instance, a patient suffering an attack of la grippe has begun to improve, and feeling satisfied that he is well on the way to recovery ventures out of doors too early, perhaps in bad weather, and returns home with the symptoms of sinusitis.

Fever. The temperature may vary from 99° to 101° , rarely higher, except in cases of pansinusitis or a fulminating attack of maxillary sinusitis due to a particularly virulent micro-organism, or where there is a threatened or actual spreading of the infection beyond the confines of the sinus walls.

Pain. The pain may be acute and lancinating or dull and heavy. In some cases the pain may be exceedingly sharp and radiate to the eye, temple, the teeth, cheek, the tip of the nose and even the lip.* Where the pain is lancinating in character it is usually due to an exposed infraorbital nerve in the roof of the sinus, *i. e.*, where there is a dehiscence in the canal. In other rare cases it may be due to the jamming of the swollen middle turbinate against the septum or lateral wall, more especially the former.

More commonly the pain is deep-seated and dull in character; when exaggerated it may become throbbing. The pain becomes more intense when the head is lowered; is always worse after lying down and eases up after arising or rather after being up for some time. It is less intense when lying on the well than on the affected side.

Tenderness. This is felt over the cheek of the affected side and along the infraorbital margin, the alveolar process and in some cases the hard palate on the side corresponding to the affected sinus. The tenderness is quite a pathognomonic sign of maxillary sinusitis. It is elicited by deep pressure or percussion. The tenderness lessens with improvement of the condition. In one case that I recall the tenderness extended to the tip of the hairs in the patient's moustache, but his was a case where the infraorbital nerve was exposed in the sinus.

Swelling and redness of the cheek. This is a sign that is not con-

*This paper deals only with that form of maxillary sinusitis of intranasal origin and where the teeth are sound.

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stant and was more or less doubted by the early investigators. However, I have found it considerably more frequent than I anticipated from my earlier teaching upon the subject. It is due to a mild grade of periostitis on the external surface of the bone, favored in some cases by a perforating vein. This swelling and redness will vary in intensity from time to time in the same individual.

It is a sign of importance when present but means nothing when absent.

Anosmia, the loss of the sense of smell, is due to the swelling of the mucous membrane about the middle and superior meatus, preventing the odoriferous particles from reaching the peripheral sense organ of smell.

Parosmia is a subjective disturbance of the sense of smell whereby the patient perceives odors that do not exist. It is probably due to pressure on the olfactory nerve terminals by the associated inflammatory edema.

Unilateral stoppage of the nose or an increase in the stoppage where it had existed previously to the attack. This stoppage is due to the general inflammatory swelling of the nasal mucous membrane on the affected side, especially in the region of the middle meatus. It is a fairly constant symptom of acute maxillary sinusitis.

Unilateral discharge from the nose is a symptom of importance when present. It may, however, be absent in the so-called locked-in empyema of the maxillary sinus; but fortunately in this case the other symptoms are so exaggerated, especially the localized pain and tenderness, that the possibility of the diagnosis escaping us is very remote.

The discharge when present is variable in amount. It usually lessens when lying down and increases after being up awhile. It may continue for an hour or two or may even last the major portion of the day, with a tendency to diminish toward the late afternoon. A unilateral discharge, together with obstruction and pain, may be met with in case of a foreign body in the nose, and in young children this combination speaks more for a foreign body than for a sinusitis.

Rhinological examination reveals:

Increased redness and swelling of the mucous membrane on the affected side. It is quite evident as compared with the opposite side. Furthermore upon closer inspection, and especially after shrinking the mucous membrane, preferably with cocain (20 per cent.), it will be

noted that the maximum amount of swelling is on the lateral aspect of the middle turbinate. If one is fortunate enough to be able to see the uncinate process it will also appear to be intensely swollen. This swelling of the middle turbinate and uncinate process is so pronounced in some cases as to give the appearance of edema, for the color is paler than the surrounding mucous membrane. In other cases the mucous membrane appears to be succulent and uneven on the surface.

A white streak of muco-pus in the middle meatus is a positive sign of sinus disease but it does not tell us exactly which of the sinuses of the anterior set is affected. If found low down in the hiatus associated with the swelling and edema just referred to, and if the anterior upper portion of the hiatus seems free, in other words if there is a free space between the middle turbinate and the uncinate process, we can say with some feeling of security that the frontal sinus is not affected and the maxillary probably is, but we cannot say positively whether the anterior ethmoids are involved or not. Whether the ethmoids are involved or not is a question of differential diagnosis to be settled by a subsequent thorough examination conducted by a capable rhinologist.

The absence of the white streak of muco-pus in the middle meatus is no sure sign of the non-existence of maxillary sinusitis. If the majority of the symptoms previously mentioned are present and this one sign is absent it points to a case of locked-in empyema. In some cases the white streak may be absent during the earlier part of our examination but present near the conclusion. When this occurs it is a very gratifying indication. It tells us that the patient came to us with a locked-in empyema and that as a result of our efforts at shrinking the mucous membrane we have, so to speak, unlocked the empyema. Such a turn of events promises a favorable prognosis under conservative treatment.

Positive puncture washings from the sinus with a Lichtwitz needle is the one most important and positive sign of maxillary sinus empyema. We are not always able, however, to tell whether the case is one of acute empyema or an acute exacerbation of a chronic empyema. If the secretion from the sinus clings together in a gelatinous-like mass and is of an amber color it is positive evidence of an acute condition. If it is creamy and of even consistency it indicates an acute condition; however this character of secretion may be found in a subacute or an

THE DIAGNOSIS OF ACUTE MAXILLARY SINUSITIS.

acute exacerbation of a chronic sinusitis. If it is granular or grumous or cheesy or flocculent it suggests a chronic sinusitis. If creamy in part and cheesy in part it speaks for an acute exacerbation of a chronic sinusitis. The results of treatment will aid us materially in arriving at a proper conclusion as to the probable duration of the process.

A shadow due to the increase of opacity on the side of the suspected sinusitis as determined by the skiagraph is a sign that suggests sinus involvement, but should not be taken too seriously in all cases. On the other hand, I recommend skiagraphy in all cases where sinus disease is known to exist or is merely suspected.

A shadow produced by transillumination of the sinus with a suitable lamp is a sign of relative importance, but not to be depended upon, since there are so many extraneous factors to be reckoned with; besides the puncture washings with the Lichtwitz needle is decidedly more dependable.

There is less difficulty in diagnosing maxillary sinus disease than there is in differentiating between a case of maxillary sinusitis pure and simple and one in which there is associated frontal sinusitis or ethmoidal sinusitis, or a combination of all three conditions. Since the differential diagnosis of these several conditions is a subject in itself we may omit a discussion of it for the present. For the same reason we shall omit a discussion of the differential diagnosis of the various pathological conditions to which the maxillary sinus is susceptible.

1831 Chestnut St.

HOMŒOPATHIC MATERIA MEDICA AND THERAPEUTICS.

REMEDIES IN ACUTE CORYZA.

Aconite: In the acute stages, after exposure to cold winds. Mucous membrane dry, nose stopped up or with scanty watery coryza. Hoarse dry cough, < at night, and in warm room; > in open air.

Arsenicum album: Useful after aconite stage. Free watery acrid discharge. Nose feels stopped up, but still it runs and burns. Edges of nostrils excoriated. < in the open air; > indoors heat. Burning in the eyes, acrid lachrymation.

Ammonium carbonicum: Acrid, watery discharge during the day; dry, stuffed at night, causing mouth breathing. Tip of nose red and congested. Hoarseness, dry cough in early morning with dyspnea, < from cold, 3-4 a. m.; > in dry room or dry weather.

Euphrasia: Acrid discharge from the eyes; bland discharge from nose; constant sneezing; < in evening, indoors, warmth; > coffee, in dark.

Mercurius: Profuse, fluent, corrosive discharge, with much sneezing. Nostrils raw, ulcerated; < in warm room, at night wet damp weather.

Pulsatilla: Frequent alternation of fluent and dry coryza, sneezes when near heat, feels better in open air. Frequently useful in later stages of colds. Stoppage of right nostril; yellow mucus abundant in the morning. Thick, profuse, yellow, bland discharge from the eyes. < warmth.

Gelsemium: Sneezing; fulness at root of nose. Watery coryza excoriating. Dull headache; sensation of a band about the head. Dry cough, with sore chest. < damp weather, at 10 a. m. > open air, continued motion.

Natrum muriaticum: Violent, fluent coryza, lasting one to three days, then changing to stoppage of nose, with difficult breathing. Discharge thin and watery, like raw white of egg. Violent sneezing. Internal soreness of nose. Cough with bursting pain in the head. > 10 a. m., heat; < open air, cold bathing.

Quillaya saponaria: Most effective in the beginning of coryza. Colds associated with sore throat, with dryness. Cough with difficult expectoration.

Nux vomica: Nose stuffed up at night. Stuffy colds, after exposure to dry cold air. Coryza fluent in daytime, stuffed at night and outdoors. Catarrhal hoarseness with scraping in throat. Tight, dry, hacking cough.

Ammonium muriaticum: Free acrid, hot watery discharge from nose, corroding the upper lip. Nose sore, raw feeling, obstructed, stuffy feeling. Hoarseness and burning in larynx, dry hacking cough.

Allium cepa: Sneezing on entering a warm room. Copious, watery and extremely acrid discharge. Feeling of a lump at the root of the nose. Bland hacking cough on inspiring cold air.

Canphor IX in colds just beginning, when there is much chilliness, a drop every fifteen minutes for five or six doses.

REVIEW.

HOMŒOPATHY IN OPHTHALMOLOGY—*Amer. Encyclop. of Ophthal.*
Vol. VIII, pp. 5,987-5,996. J. L. Moffat.

Dr. Moffat has received the compliment of being asked by the editors of the *American Encyclopedia of Ophthalmology* for an article on Homœopathy in Ophthalmology—and the selection of our distinguished confrere was a happy one. The article is a general deposition on Homœopathy in clear and direct terms and wisely does not go into the matter of the indications of certain eye remedies. He outlines the principles of individualization of the symptom-complex and of the remedy as the key to the cure, and upon this points out our plans for selection of the remedy from the patient's drug-picture. He handles the subject gracefully, conservatively, and yet forcefully, and gives us an article that is an ideal exposition to those not familiar with our science.

The eighth volume of the *Encyclopedia*, as a whole, is an excellent piece of work, covering matter from "H to Institutions for the Blind." It well sustains the reputation already made for itself.

D. M.

POCKET MANUAL OF HOMŒOPATHIC MATERIA MEDICA. By William Boericke, M. D. Sixth Edition. Revised, rewritten and enlarged, printed on elegant India bible paper and bound in handsome black flexible Morocco leather. A wonderfully compact volume containing over 1,293 pages, only one inch in thickness and weighing 10½ ounces. Price (postpaid), \$3.50. Boericke & Runyon, Publishers, New York and Philadelphia.

Boericke's *Materia Medica*, comprising the characteristic and guiding symptoms of all remedies, together with a compact Therapeutic Index and a comprehensive Repertory is now issued in its sixth edition, which has been completely revised and contains several hundred additions and verifications. It is a pocket encyclopedia of Homœopathic *Materia Medica*, giving in condensed form the experience of the Homœopathic School with all remedies, proved or partially proved or clinically suggested by applying the Law of Similars. It

REVIEWS.

is a work needful to every physician who wishes to keep abreast with the times. It is supplementary and additional to all other works on *Materia Medica*, even the largest and latest, because it contains all new remedies and verifications mentioned in periodical literature to date.

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That this handy reference book should appear in its sixth edition is an indication of its popularity among the physicians. The sixth edition is revised up to date. The India bible paper upon which is printed the new sixth edition is strong and durable in spite of its light weight. It also permits of a greater number of pages within the covers than any other paper; the 1,293 pages occupies the space of but one inch. It is a book that should be carried in the pocket of every practicing physician.

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Journal of Ophthalmology Otology and Laryngology

Vol. XXII

JULY, 1916

No. 7

Editorial

ANNUAL MEETING OF THE AMERICAN MEDICAL EDITORS' ASSOCIATION.

The annual meeting of this Association will be held at the Mc-Alpin Hotel, New York City, on October 25th and 26th.

A most interesting programme is in course of preparation, and the Local Committee composed of the following members is an assurance of a successful convention.

Dr. Thomas L. Stedman (Editor *Med'l Record*), Chairman.

Dr. R. H. Sayre (*New York Medical Journal*).

Dr. Brooks H. Wells (Editor *Amer. Jr'l of Obstetrics*).

Dr. Frank C. Lewis (*Internat'l Jr'l of Surgery*)

Dr. Ira S. Wile (*American Medicine*).

The Officers of the Association for 1915 and 1916 are as follows:

Dr. Edw'd C. Register, President. (*Charlotte Med'l Journal*, Charlotte, N. C.)

Dr. W. A. Jones, 1st Vice-President. (*Journal-Lancet*, Minneapolis, Minn.)

Dr. G. M. Piersol, 2nd Vice-President. (*Amer. Jr'l Med'l Sciences*, Philadelphia, Pa.)

Dr. J. McDonald, Jr., Secretary and Treasurer. (*American Journal of Surgery*, New York.)

EXECUTIVE COMMITTEE.

Dr. C. F. Taylor (*Medical World*, Philadelphia, Pa.).

Dr. John C. MacEvitt (*N. Y. State Jr'l of Medicine*, New York).

Dr. A. S. Burdick (*Amer. Jr'l of Clin. Med.*, Chicago, Ill.).

Dr. Joseph MacDonald, Jr. (*Amer. Jr'l of Surgery*, New York).

The meeting on October 25th and 26th will be devoted exclusively to problems of a strictly journalistic nature which will be of import-

EDITORIAL.

ance and interest to every editor and publisher of a medical journal. Among the papers to be presented are the following:

"Editorial Control;" "The Editor's Prerogative in Editing Original Articles;" "Book Reviews in Medical Journals;" "Problems of the Subscription Department;" "The Relationship Between Medical Journals of the Day;" "The Up-Lift in Medical Journalism;" "The Influence of the Medical Press and Profession in Public Affairs;" "The Rights of an Author in the Disposition of His Contribution;" etc.

ANNOUNCEMENT.

It is a pleasure to announce that Dr. Douglas Macfarlan, of Philadelphia, has consented to share the burden of the editor again, and will act as Associate Editor for the month of August.

NOTICE.

Those desiring copies of the Symposium on Speech, Voice and Hygiene of the Vocal Tract, published in the April number of the JOURNAL, may obtain them from The Nelson-Schram Company, 14 Devereux Street, Utica, N. Y.

ACUTE MASTOIDITIS.

PREFACE.

ANATOMICAL PLATES OF THE TEMPORAL BONE.

Gilbert J. Palen, A. B., M. D.

THE MASTOID PROCESS.

Gilbert J. Palen, A. B., M. D.

ACUTE MASTOIDITIS, SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT.

Gilbert J. Palen, A. B., M. D.

THE BACTERIOLOGY AND VACCINE THERAPY OF MASTOIDITIS.

S. W. Sappington, M. D.

ROENTGEN RAY AS A DIAGNOSTIC AGENT IN MASTOID DISEASE.

J. W. Frank, M. D.

THE NON-OPERATIVE TREATMENT OF ACUTE MASTOIDITIS.

H. S. Weaver, M. D.

POST-OPERATIVE CARE OF ACUTE MASTOID CASES.

Joseph V. F. Clay, M. D.

PREFACE.

THE study of the anatomy of the temporal bone is of great importance to the otologist, and such a study of a large series of temporal bones and repeated sections of different portions of this bone are necessary if we would acquire a thorough knowledge of its anatomy. After such a study one is impressed with the fact that while the mastoid portion is not constant in its structure and formation, the petrous portion of the temporal bone, and especially of the bony labyrinth, is practically the same in every specimen examined.

The following series of plates are made from photographs of specimens from our personal collection. While some of the plates are not as clear as we would wish, still we trust that they will prove interesting and instructive to the readers of the JOURNAL. Where necessary to bring out the finer structures, enlargements have been made.

If the cuts are examined with a magnifying glass of low power the structures can be better appreciated.

G. J. P.

ANATOMICAL PLATES OF THE TEMPORAL BONE.



FRONTISPIECE.—This is a good sample of the temporal bone showing a fairly well developed spine of Henle and temporal ridge. Of interest is the exceptionally long styloid process which in the original was longer than that shown in the plate, part of it having been broken off. A section of this bone is shown in Plate XXV.

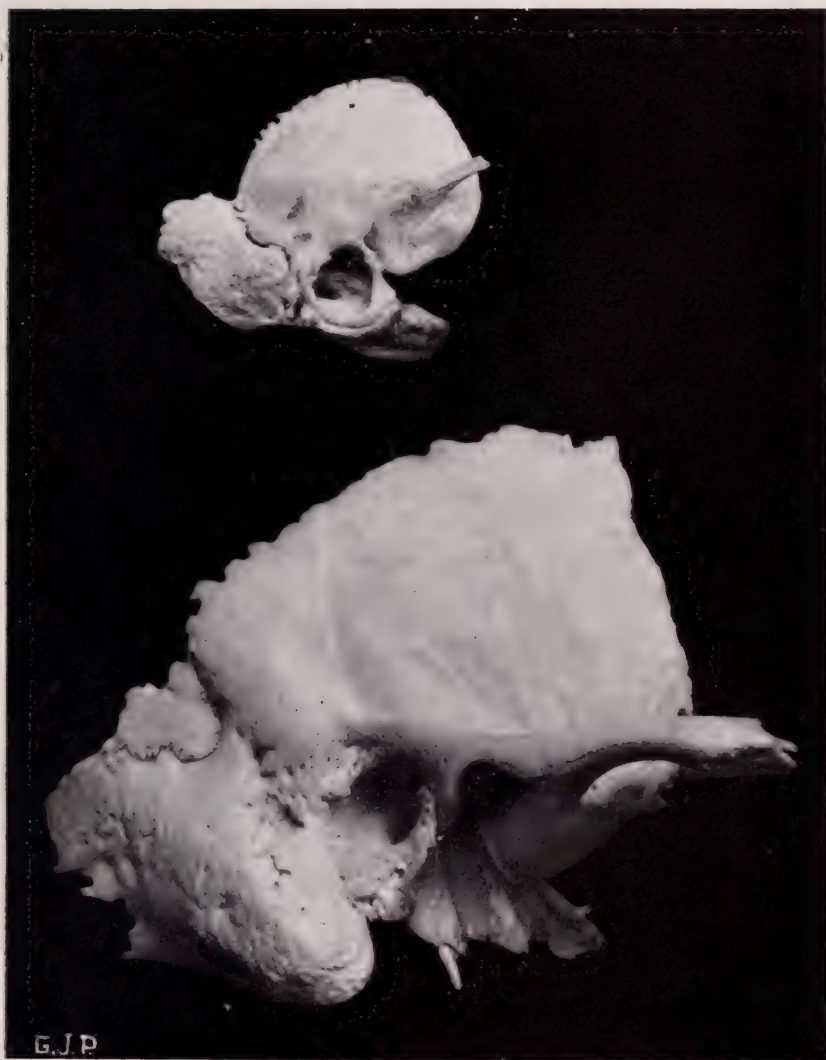


PLATE II.—The upper figure is that of a temporal bone of a fœtus representing well the type of a child's temporal bone. The squamo-mastoid suture is well seen and below the end of this is seen the foramen for the facial nerve. The mastoid process is not yet developed. The bony canal consists of the annulus tympanicus, the horse shoe shape of which is well seen in the cut.

The lower figure is that of a temporal bone of an adult. Here can still be seen the position of the squamo-mastoid suture. The spine of Henle is well marked in this specimen.

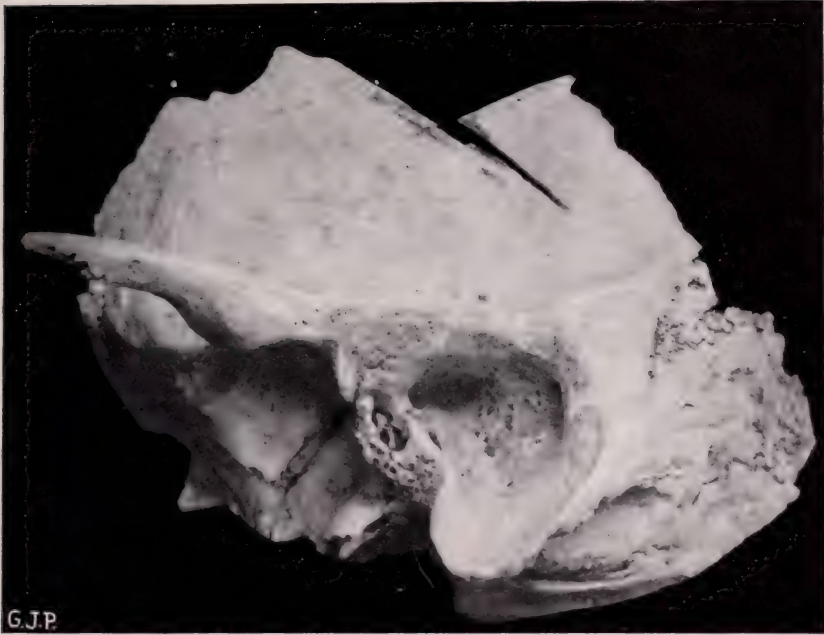


PLATE III.—In this specimen of the left temporal bone the mastoid cells have been thoroughly removed and the posterior wall of the external auditory canal removed almost to the additus and so cut that the processus brevis of the incus is seen resting upon the floor of the additus ad antrum. Just back of this a prominence, the horizontal semicircular canal and below this a dark area marking the opened facial canal. In the depths of the external auditory canal can be seen the long arm of the malleus.

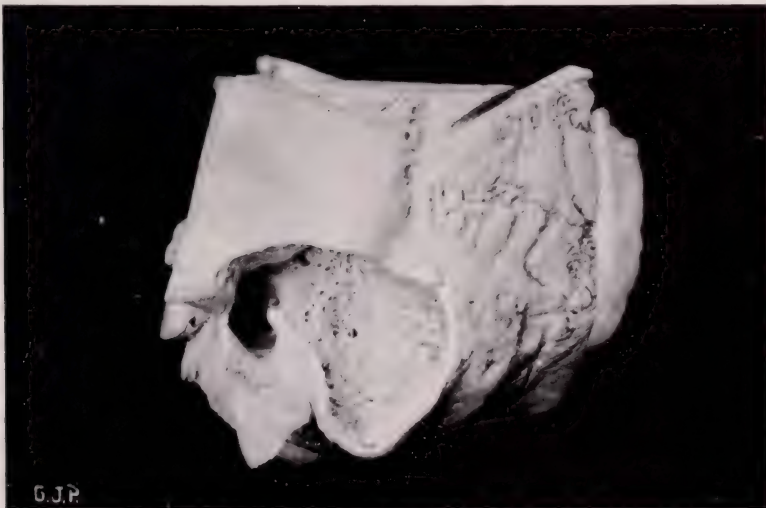


PLATE IV.—The entire cellular structure of the mastoid has been removed and the posterior canal wall reduced to the level of the additus ad antrum. Just above the inner end of the canal wall can be seen the head of the stapes. Above this the horizontal semicircular canal and curling downward from this the facial canal.

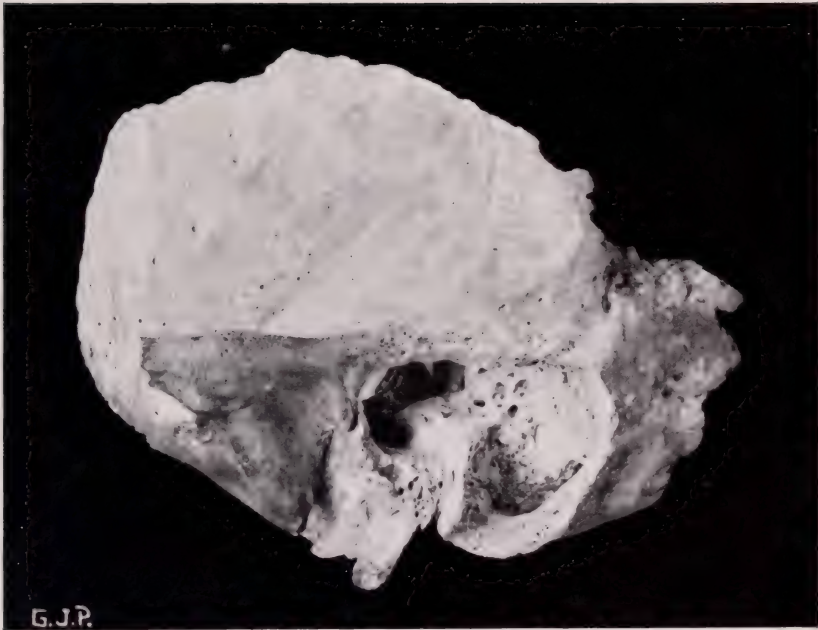


PLATE V.—Left temporal bone. The entire cellular structure of the mastoid is removed showing a small opening over the lateral sinus. The posterior wall has been lowered so that the relation of this wall to the anterior vertical and horizontal semicircular canals can be seen in the depths of the bone. The small dark opening marks the exposure of the horizontal semicircular canal while the anterior vertical canal curves upward above this. Below the outer limb of the anterior vertical canal can be seen the oval window.



PLATE VI.—The upper figure is that of the right temporal bone of a child showing the squamo-mastoid suture, the stylo-mastoid foramen and annulus tympanicus. The figure below to the right shows the right temporal bone with the membrana tympani in position. The next figure to the left shows the right temporal bone, the drum and annulus tympanicus have been removed so that the ossicles are shown in the middle ear cavity. The figure to the left is the membrana tympani which has been removed.

ANATOMICAL PLATES OF THE TEMPORAL BONE.

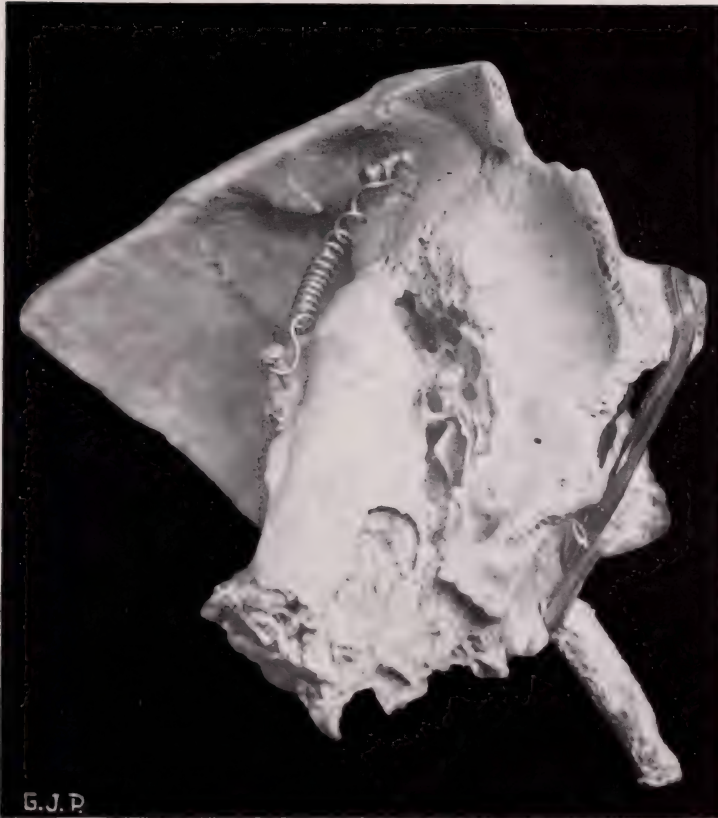


PLATE VII.—Left temporal bone. Looking down into the antrum and middle ear cavity. The upper dark opening shows the mastoid antrum, the roof having been removed. Below this can be seen the head of the malleus articulating with the incus. Stretching across the middle ear cavity is seen the tendon of the tensor tympani muscle, below this the manubrium of the malleus attached to the membrana tympani, which latter is seen drawn inward toward the middle ear cavity.

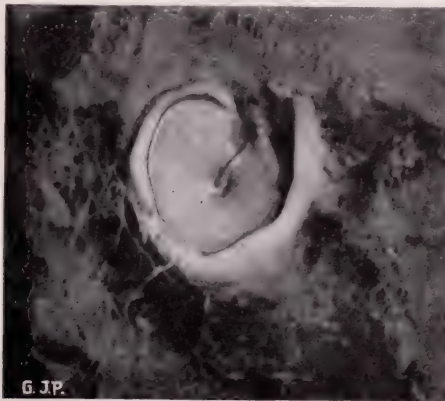


PLATE VIII.—The right membrana tympani of a child. The annulus tympanicus is well seen as is also the short process and the manubrium of the malleus, with the depression at the umbo.



PLATE IX.—The section is made through the mastoid process and carried forward so as to expose the mastoid antrum and middle ear cavity.

In the portion of the specimen to the left is seen the inner end of the external auditory canal. The upper portion of the mastoid process is of the pneumatic type while the tip shows a cancellated structure. In that portion of the specimen to the right we see above the mastoid antrum the horizontal semi-circular canal, below this a small opening in the fallopian canal, just below this the promontorium. Above the promontorium is seen the canal of the tensor tympani muscle ending at the processus cochleaformis at the anterior margin of the oval window. Above the canal of the tensor tympani muscle a groove in the bone marks the course of superficial major petrosal nerve and just below the end of this groove to the right is seen an opening through which the internal carotid artery passes.

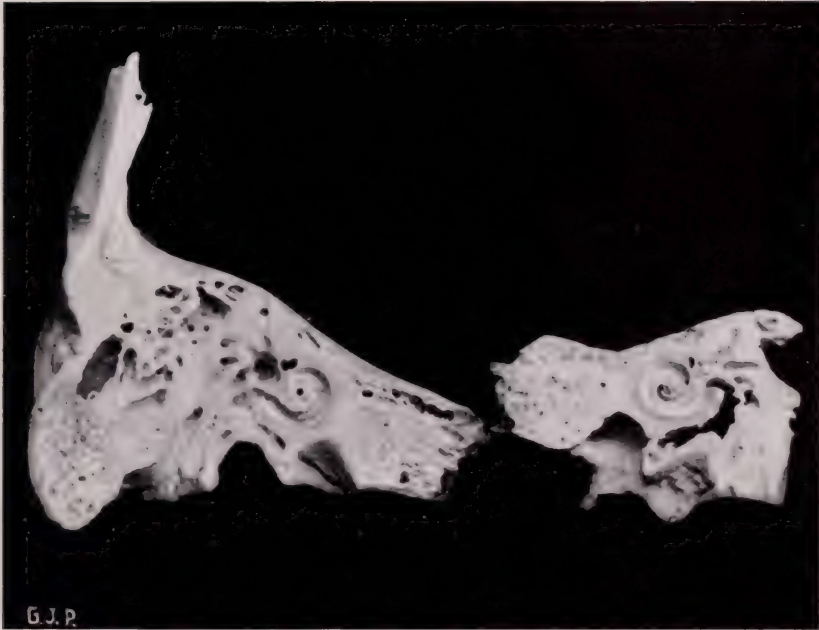


PLATE X.—The portion of the above specimen to the right has been sectioned so as to cut the anterior vertical and horizontal semicircular canals, facial canal, vestibule and cochlea, and this plate shows the two halves of this section. Above the upper central portion of the left specimen is seen the anterior vertical canal coming down to the vestibule. The horizontal canal is also shown coming forward. Each of these canals shows at the vestibular end a broadening known as the ampulla. Below the horizontal canal is seen a cross section of the facial canal which appears again sectioned a little farther down to the left, having been cut at the stylo-mastoid foramen. Below the horizontal semicircular canal is seen the vestibule, in the depths of which some openings of the other semicircular canals can be seen. Just below the vestibule is seen the spiral lamina and below this the beginning of the first turn of the cochlea which has been cut exactly at the round window. Note also the dark opening between the vestibule and cochlea showing the position of the facial nerve in relation to these structures. In that portion of the specimen to the right we see the cochlea turning upward around the modiolus to the cupola. The spiral lamina can be seen distinctly winding upward around the modiolus. The dark oval opening just below the cochlea marks again the facial canal. Anterior to this the anterior vertical canal is seen and below this the horizontal canal. Below this the facial canal and just back of this the oval window, the dark area beneath this marking the opening into the middle ear cavity.



PLATE XI.—In the upper central portion of this specimen is seen a cut in the bone. Below this a sloping white area marking the horizontal semi-circular canal and facial canal and a little below and in front of this is seen the stapes in the oval window. Above this the processus cochleaformis and extending to the right from this the tensor tympani muscle is seen lodged in its canal. Directly below the stapes is seen a prominent portion of bone from which the stapedius muscle springs. Between this and the stapes is seen the dark promontorium and extending forward from this the Eustachian tube.

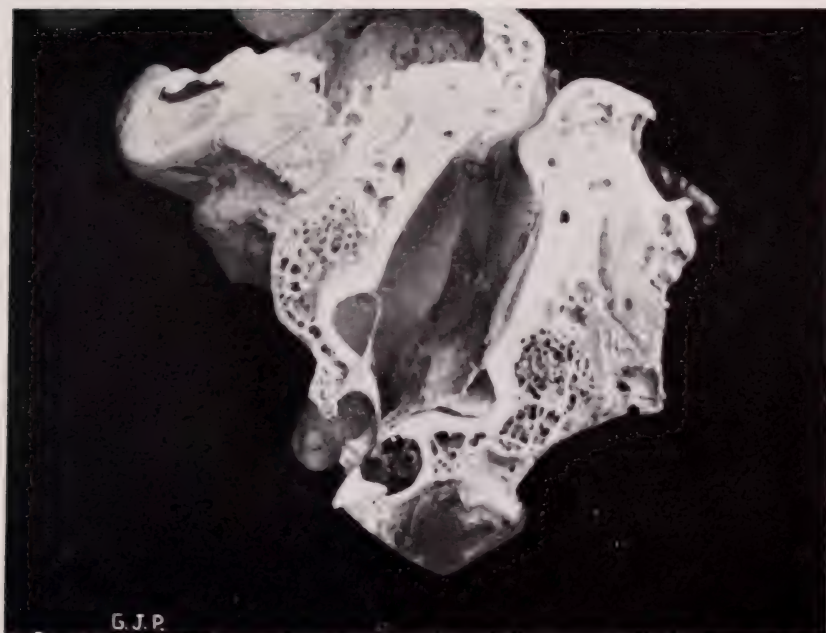


PLATE XII.—The above specimen has been cut through the petrous pyramid and this plate shows the resulting sections. In that portion of the specimen to the right is seen the so-called solid angle formed by exposing the horizontal semicircular canal and upper and lower limb of the posterior vertical canal. Just below the horizontal canal the facial nerve is seen exposed as it passes vertically downward to emerge at the stylo-mastoid foramen where the nerve can be seen widening out in a somewhat fan shape. The solid angle can be seen in the left hand portion of the specimen.

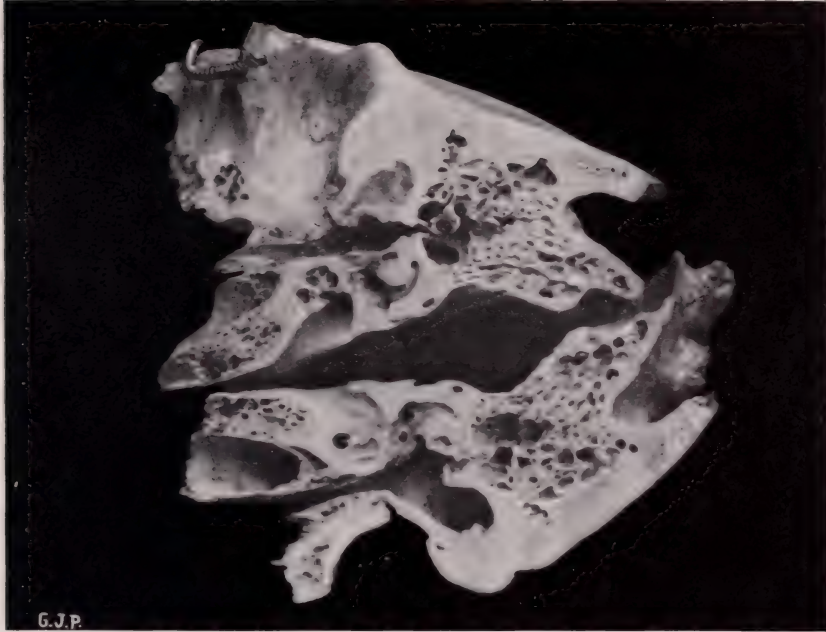


PLATE XIII.—A horizontal section through the left temporal bone along the roof of the external auditory canal.

Starting in the dark area in the lower portion of the cut, this being the external auditory canal, we pass forward to the left into the middle ear cavity then forward into the Eustachian tube. Above the Eustachian tube (anatomically inward), to the left the canal of the internal carotid artery is seen. Just in front of this the cochlea and above the cochlea the internal auditory canal. To the right from the cochlea we see into the floor of the vestibule finding two small openings, the upper being that of the posterior semi-circular canal while the lower is the opening into the scala vestibuli of the cochlea. Extending backward from the upper opening a partial section of the horizontal canal below which we see the facial canal in section. The upper portion of the plate shows below the internal auditory canal leading up to the base of the modiolus of the cochlea. To the right of this the roof of the vestibule. Curving backward the horizontal canal, above this the middle ear cavity and forward from this the canal of the tensor tympani muscle.



PLATE XIV.—A specimen of the right temporal bone very much enlarged in order to show the crista vestibularis in the floor of the vestibule which divides the saccule and utricle. This is seen as a thin whitish line running across the vestibule. The anterior vertical canal is seen and back of this is the posterior verticle. In front of the vestibule the internal auditory canal is exposed. The bristle marks the course of the facial nerve as it passes from the internal auditory canal between the cochlea and vestibule, then passing backward under the anterior vertical and horizontal canals. The middle ear cavity is shown exposed and the Eustachian tube is seen passing outward and downward to the right, while above it is seen the canal of the internal carotid artery.

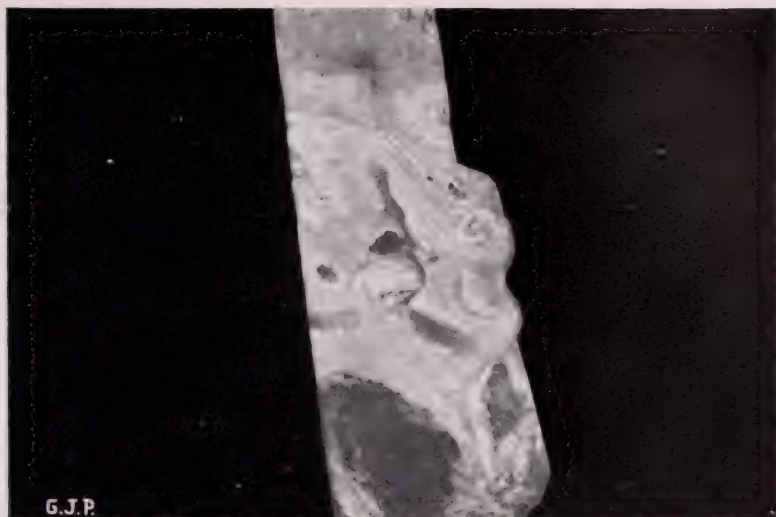


PLATE XV.—Outer wall of the left vestibule. The anterior vertical canal is seen in section just below this, the opening of the horizontal semicircular canal and a further section of this canal is seen to the left. In front of this last opening is seen the oval foot plate of the stapes. A half moon shape appearance in the front of the plate marks the position of the cochlea.

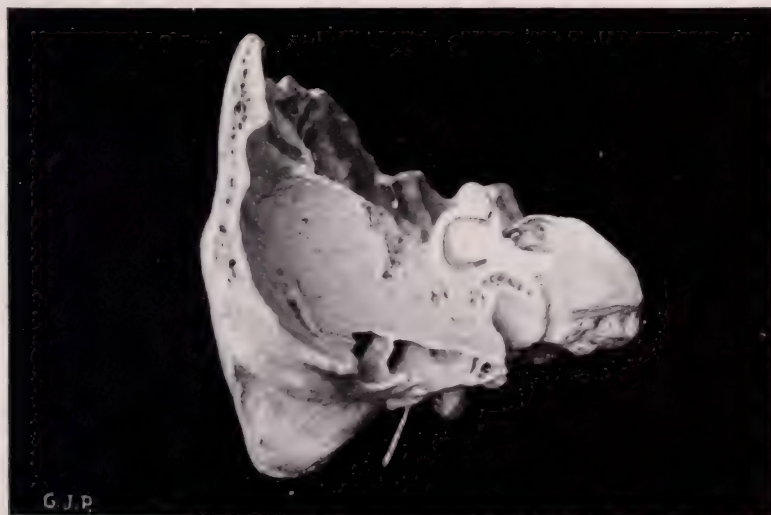


PLATE XVI.—Left temporal bone. The posterior semicircular canal is seen exposed showing very well the horseshoe shape of this canal. Its common opening with the anterior vertical canal is also exposed above. Just in front and to the right from the posterior vertical canal is seen an oval opening through which passes the facial nerve at the end of the internal auditory canal, the roof of which canal has been removed. A bristle passing out of the lower portion of the specimen marks the facial nerve as it emerges from the stylo-mastoid foramen. Note the inward extension along the base of the petrous pyramid of the mastoid cells.



PLATE XVII.—The right cochlea is shown in relation to the middle ear cavity. The two and a half turns can be readily seen and the spiral lamina can be followed upward to the cupola. Just above the cochlea the course of the facial nerve has been exposed as it passes across to the middle ear cavity from the internal auditory canal. Directly above this can be seen the anterior vertical canal.



PLATE XVIII.—This plate shows also the right cochlea in relation to the middle ear cavity.

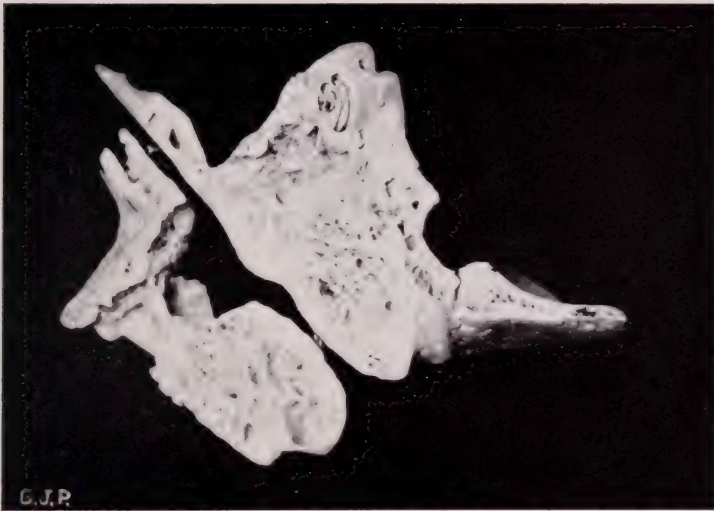


PLATE XIX.—Another view of the right cochlea. The spiral lamina can be followed beautifully through its turns around the modiolus to the cupola. The stapes is seen below in the oval window.



PLATE XX.—In the center of this plate is very beautifully seen the ending of the spiral lamina at the cupola, where it presents a hook-shaped ending known as the hamulus. It is around this that the scala vestibuli and scali tympani come together. Directly above this is seen a portion of the first turn of the cochlea and spiral lamina. Note also the petrous character of the bone, which shows as a circle around the cochlea.

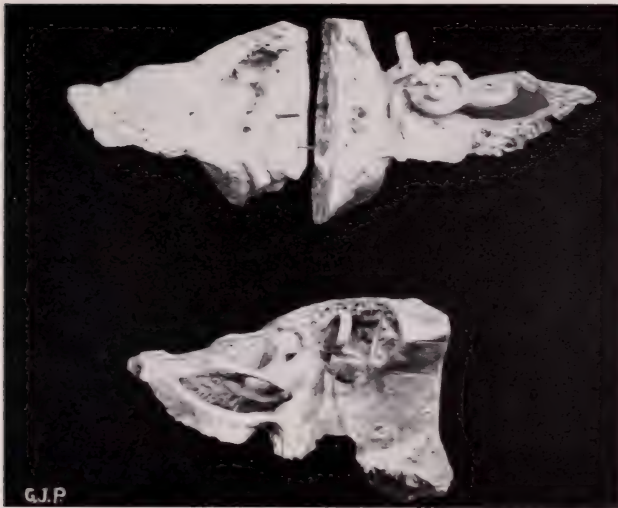


PLATE XXI.—The right bony labyrinth. In the upper figure the anterior vertical canal is seen; below this and passing backward and downward a dark line being the exposed facial canal. The cochlea is exposed and the internal auditory canal (extending to the right from this) has been chiseled out.

The lower figure shows the posterior vertical and anterior vertical canals and the internal auditory canal with its roof removed showing the course of the facial nerve passing out of the end of this canal.

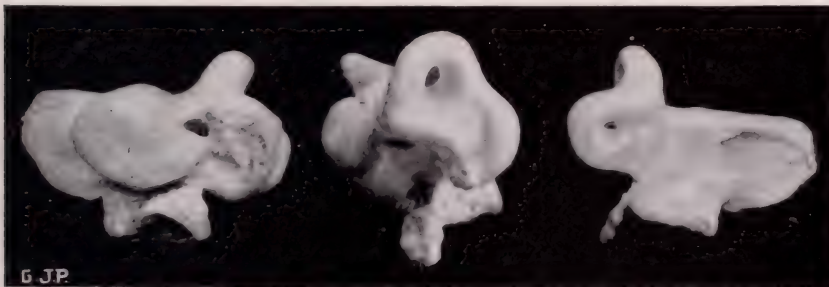


PLATE XXII.—The left bony labyrinth. The figure to the left shows a lateral view of the bony labyrinth. The cochlear whorl can be traced in its first turn from below the oval window to the left, then upward. The oval window is seen, as also the anterior vertical and a portion of the posterior vertical canal, while beneath the horizontal is seen adhering a portion of the facial nerve. The curved portion of the bone below marks the floor of the middle ear cavity. The central figure gives a posterior view of the canals, showing their relation to each other. The oval window can be seen just beneath the outer limb of the anterior vertical canal, while the cochlea can be seen bulging out to the left. The figure to the right shows the posterior and anterior vertical canals and the internal auditory canal passing into the cochlea.



PLATE XXIII.—View of the base of the skull showing the semicircular canals. Note that the planes of the anterior vertical canals would meet at the posterior portion of the foramen magnum at an angle of 90° , and also note that the anterior vertical of one side is practically parallel with the posterior vertical of the opposite side.

THE MASTOID PROCESS

THERE is no cranial bone which contains anatomically so much of importance as does the temporal bone, nor is there any the anatomy of which it is more difficult to understand. This statement is well borne out when one considers that within the temporal bone are found those structures which have to do with the sense of hearing, and furthermore other highly important structures having to do with the preservation of equilibrium. As one studies this bone, and especially those structures lodged within it which have to do with the functions above mentioned, one cannot but stop to think what truly wonderful mechanisms these are and especially how minute the structures, the functions of which are so great.

It is not our intention here, however, to go into the details of the anatomy of the temporal bone as a whole, but to deal especially with the mastoid portion, and we have mentioned the above few points simply to call attention to the fact that on account of the contiguity of structure, the finer structures within the temporal bone must always be borne in mind in considering diseased conditions or operations upon the mastoid process.

Not only is the study of the mastoid an interesting one but to the one who will deal skillfully with the diseased conditions of this process, the knowledge of its anatomy becomes an absolute essential. This can be gotten only by a careful personal study of large numbers of specimens of the temporal bone and various sections of this bone.

Through such a study of specimens one is impressed with the fact that there is no uniform formation of this process; that as regards its gross appearance it varies considerably in size, and especially, after studying many sections of this process, are we impressed with the wide variations of its contents. Furthermore, we find upon studies of series of sections remarkable differences in the thickness and density of the walls of the mastoid process. *These wide variations of structure are the causes of the different types of mastoiditis which occur, and account also for the location and occurrence of many of the clinical*

symptoms and signs. We feel that any one making a careful study will arrive at the same conclusions.

If we take in our hands a skull and look at the mastoid process we find first that it articulates with the parietal and occipital bones; that anteriorly it is continuous with the squamous portion of the temporal bone, that its upper portion is limited, in the majority of skulls, by a ridge extending back from the zygoma, the so-called temporal ridge; that at its extreme anterior upper margin is a small spine known as the supra-meatal spine or spine of Henle; that just posterior to this and beneath the temporal ridge is a small triangular area in which are numerous small foramina; that the upper two-thirds of the outer surface is, in the main, smooth, while the lower one-third and tip are roughened, due to the attachments of the sterno-mastoid and splenius capitis muscles, that in many skulls, centrally, in the extreme posterior margin of the mastoid, there is an opening or foramen for the transmission of the mastoid emissary vein. (This, however, often falls within the occipital bone just back of the articulation with the mastoid process.) We find also that the anterior portion of the mastoid process forms a portion of the posterior wall of the external auditory canal.

If now the skull is held so as to view the mastoid posteriorly (see plate xxiv), we find that the lower portion exhibits a true nipple-like process (therefore called mastoid of breast-like), that the inner surface of this mastoid tip is smooth and in many specimens exceedingly thin, while in others a defect will be found leading directly into the mastoid process. We note also that the inner surface of the tip forms the outer portion of the digastric fossa.

Upon looking at the inner surface of the skull we find a close relation to the lateral sinus, and we note that the sinus passes from its vertical to its horizontal portion, almost invariably, exactly at the parietal notch.

If now we examine sections of the mastoid process which are cut postero-anteriorly and extended forward to include the middle ear and Eustachian tube, we can then study the walls of the mastoid and the contained structures (see plates xxv, xxvi, xxvii). With such a series of specimens before us we are at once impressed, as we look from specimen to specimen, how widely different they are as to thick-

THE MASTOID PROCESS.

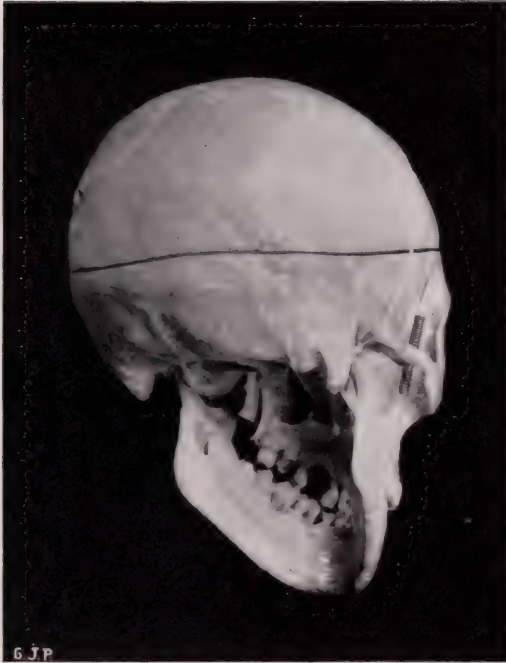


PLATE XXIV.—A posterior lateral view of the skull showing on the left side the inner surface of the mastoid tip; on the right side the digastric fossa; on the posterior surface of the skull the superior curved line. The understanding of the muscular attachments along the tip of the mastoid and superior curved line and the presence of the digastric muscle in the digastric fossa is essential for the thorough understanding of the clinical course of Bezold's mastoiditis.



PLATE XXV.—Marked cellular development of a large temporal bone. Note the large tip cells, also the extension forward into the zygomatic region. In this specimen the cells extended far out into the zygoma.

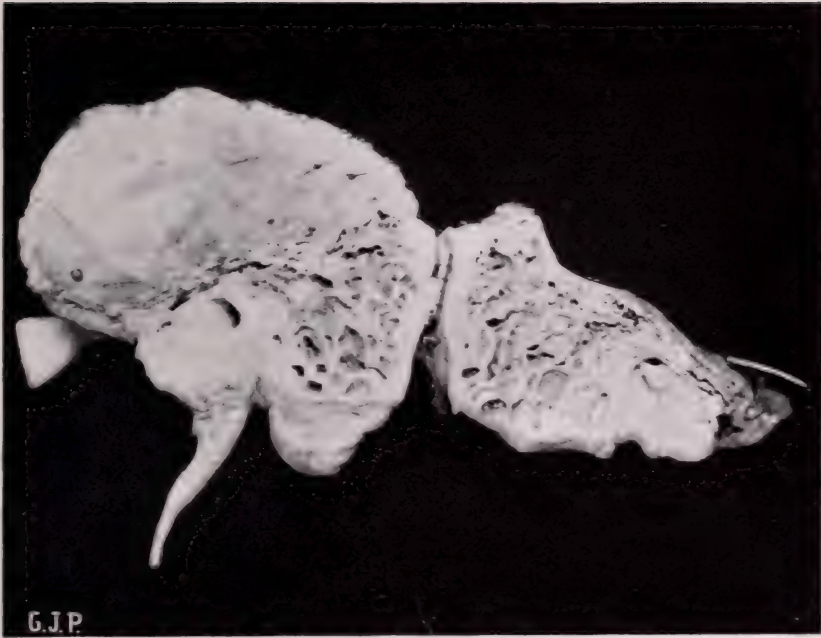


PLATE XXVI.—This is the right temporal bone from the same skull as the previous specimen, showing again in section the tremendous cellular development. The middle ear cavity can also be seen to the right of the cut showing the oval window.

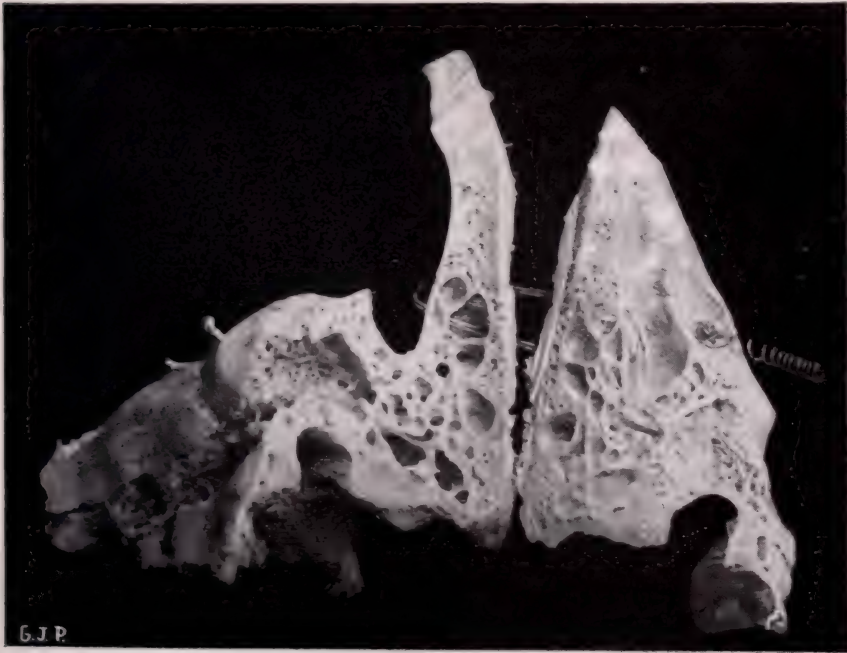


PLATE XXVII.—Another plate showing a different type of cellular development. Note the difference in thickness of the outer and inner plates.

ness and density of their walls, and also how greatly they vary in the amount and character of their contents. We note that this process, or capsule, consists in the main of two plates. As we study the different specimens we find that the distance of these two plates from each other varies considerably, and it is at once apparent that this is due to the character of the contents. In the majority of the specimens the plates are widely separated due to the presence of a large number of bony cells, varying materially in size and shape. These can be traced in some of the specimens well forward into the zygoma, backward to the parietal notch and below into the tip of the mastoid process. In other specimens the cells appear only in certain portions of the mastoid process or they may be lacking entirely, the plates being separated simply by diploe or by tissue of a sclerotic nature. In these types of mastoid it will be found that as the inner plate approaches the outer, the cranial structures lying upon the inner plate also lie closer to the outer surface of the skull. In every specimen examined, however, no matter what its anatomical structure, there is found in the upper anterior portion one large cell which is called the mastoid antrum, this communicating anteriorly by means of the additus ad antrum with the middle ear cavity.

The study of this important cell shows: anteriorly a close relationship with the upper posterior wall of the external auditory canal and the horizontal semicircular canal; superiorly with the middle fossa and posteriorly with the posterior fossa and lateral sinus.

Studying the sections again we note wide variations in the thickness and density of the plates. In the one specimen the outer plate is the less dense, in another the inner plate, and in another the roof of the mastoid antrum.

From this brief description we thus see, as before stated, the lack of uniformity of the formation of the mastoid process, and we note also its relation to the middle and posterior fossæ, the lateral sinus and bony labyrinth.

Retaining then in our mind these anatomical relations of the mastoid process, we are in a position to understand the various complications which are liable to occur during the course of mastoiditis. Realizing also the wide variation in the anatomical structure of the mastoid, we can understand the reason for the occurrence of the clinical symptoms and signs and can also understand why we did not

always find the same clinical picture in every case of mastoiditis. Given, for instance, a typical pneumatic mastoid, one in which there are a large number of bony cells, we can understand that the process will spread first through these cells before any pressure will be exerted upon the plates, and that then the direction in which the diseased process will spread depends to a large extent upon the resistance of the plates. In the diploëic type of mastoid where there is present only the antrum or a few cells, the diseased process will be less extensive, being limited to the cellular area.

In order to understand some of the advanced and also typical symptoms, it is necessary for us to briefly consider the external covering of the mastoid process and contiguous areas.

We find the temporalis muscle limited below at the temporal ridge, that it passes outward and forward over the root of the zygoma covering the entire outer portion of the squamous portion of the temporal bone. Below the temporal ridge and extending down to about the lower third, the surface of the mastoid is smooth and here covered only by the integument and periosteum, while the lower third is roughened, and here are attached the tendons of the sterno-mastoid and splenius capitis muscles, these forming a dense covering over this portion of the mastoid. In cases of perforation from the mastoid cells occurring externally we can understand that pus coming out under the temporal muscle may have the tendency to spread downward along this muscle. That in case of fistula below the temporal ridge in the upper two-thirds of the mastoid, the classical post-auricular oedema with fluctuation will occur, as the mastoid at this point is covered only by periosteum and integument. If the perforation occurs in the lower portion of the mastoid the pus is then limited externally by the tendinous attachments of the neck muscles and the swelling is, therefore, brawny and lacking in fluctuation.

ACUTE MASTOIDITIS, SYMPTOMATOLOGY, DIAGNOSIS AND TREATMENT.

IN the study of any diseased condition the question of cause becomes a very important factor in the subsequent treatment and also of great importance from a prognostic standpoint. Too often the question of cause is not thoroughly considered so that the acute condition may run its course, resulting, through either local

or operative treatment, in a cure of the condition, while the factor which has brought about this acute condition may still exist and either cause a recurrence or in some other way continue to affect the health of the individual. In no class of cases does it seem of more importance to determine this causal factor than in cases of acute mastoiditis, for, in recent years, so much has been written concerning focal infection and the literature is so rich with records of cases of acute mastoiditis which undoubtedly were due, not to acute infections such as influenza, etc., but to chronic long standing foci of infection. It is necessary, therefore, for the otologist, who will thoroughly and conscientiously take care of patients suffering from acute mastoiditis, to extend his examination to a thorough study of the tonsils, teeth, accessory cavities and post-nasal space. In doing this he may gain much which will be of great advantage to him in the conduction of the present condition, and, furthermore, he may render a very valuable service to his patient in uncovering and subsequently eradicating a dangerous focus of infection, thereby saving the individual much future possible illness. How frequently we have seen, during the after-treatment of acute mastoiditis, the occurrence of acute tonsillitis, and upon careful inquiry have found that the patient was subject to this condition. Further inquiry and investigations have proven to our satisfaction that the patient's mastoiditis has been caused by a chronic, or latent diseased condition of the tonsils which was acting as a focus. We could cite here many cases illustrating this point.

Bearing in mind the well known foci of infection such as the tonsils, accessory cavities of the nose, teeth, adenoids, etc., we should consider, while taking our history of the case, the possibility of the present condition being due to some such focus, and, therefore, very carefully question our patient concerning any past history relating to these structures.

In a case of acute mastoiditis following upon an acute tonsillitis it is very easy to overlook the fact that the acute tonsillitis, which was the immediate cause of the attack, was possibly only an acute exacerbation of a chronic condition. It is quite possible also that, in the case cited (that is one following tonsillitis), that this latter condition was itself secondary to some other chronic focus of infection. A case in point is that of Mary C., who consulted us concerning an acute mastoiditis following tonsillitis. Cultures taken from the ex-

ACUTE MASTOIDITIS.

ternal auditory canal before operation, from the mastoid wound during operation and from the tonsils, showed the same type of streptococcus. The patient gave a history of tonsillitis, so that we seemed guaranteed in looking upon the tonsils as the point of infection and were considering a tonsillectomy when the mastoid wound had completely healed. About four weeks after the operation, however, our patient developed intense pain anterior to the auricle, and there was noted a sensitive swelling at this point. Upon careful examination of the wound, no local condition could be found to account for the symptoms, but upon questioning the patient closely, we determined, what we should have determined in our first history had we been as careful as we should have been, that the patient had a history of an abscessed lower molar, on the same side as the ear condition, which her dentist had been treating for some months. She furthermore stated that she had recently had considerable pain in this tooth. Upon removing a temporary filling from the lower molar pus issued from the cavity and a culture of this showed the same strain of streptococcus. Upon removal of the molar the aural symptoms disappeared rapidly and the general condition of our patient, which we found had not been good for some time, improved immediately. With these facts in mind, as pointed out by my associate, Dr. Clay, in his paper on "The After Treatment of Mastoid Cases," any such possible foci of infection must be taken care of. It has been our custom during the care of all cases of mastoiditis to watch carefully the condition of the tonsils, teeth and accessory cavities, and where necessary to keep them in the healthiest condition possible until such time as they can be properly dealt with. From our study of acute mastoid cases we have come to the conclusion that many cases of so-called grippal infection are not in reality acute epidemic infections, but are due to the out-pouring of bacteria from some chronic focus of infection. Many of the cases which we have treated have given a history of one or two such apparent grippal infections yearly. A confrere of the author suffered every year from attacks of acute tonsillitis, and in the intervals from vague joint symptoms and headaches of a toxic nature. Subsequently, after treatment of an upper molar, the joint and toxic symptoms entirely disappeared, and he has not had an attack of tonsillitis since.

From what has been said it would then seem of the greatest value in every case of mastoiditis to thoroughly investigate the gen-

eral condition of our patients and not to assume, after superficial examination, that the attack of mastoiditis was due simply to an acute condition of the tonsils or some other structure within the nose or naso-pharynx. We do not wish from the foregoing to be understood as stating that acute mastoiditis does not occur during acute epidemic infections such as la grippe, scarlet fever, measles, etc., or from obstructive conditions in the nose or naso-pharynx, which render the tissues within the mastoid more prone to infection.

Undoubtedly a contributing factor, in acute mastoiditis, is the peculiar anatomical structure of the given case which renders the mastoid more liable to infection. A further contributing factor is the lack of resistance of the patient at the time of the infection.

As the pathology and bacteriology of mastoiditis is taken up in a later paper we do not here go into the question of the type of infection as a causative factor or as a prognostic aid.

The diagnosis of acute mastoiditis becomes a very simple matter in that class of cases which exhibit the so-called classical symptoms, but every operator of any experience has learned that many cases are quite atypical, and in some all of the classical symptoms are lacking. We have made a special study of the symptoms occurring during the course of cases under our care and have learned to lay great stress upon even vague symptoms which we have elicited. We feel that the vast majority of these symptoms are readily explained by anatomical and pathological findings.

Believing as we do in the great value of the subjective symptoms, we study every subjective symptom elicited most carefully and feel that by so doing we can often make good deductions as to the extent of the pathological condition within the mastoid; also we make it a rule to search carefully for objective signs, some of which will only be found upon thorough search.

These symptoms and signs will be best considered under the usual classification of *typical* and *atypical* and a further heading of *symptoms suggesting extension*.

The typical symptoms and signs are, (1) aural discharge, (2) temperature, (3) pain, (4) tenderness, (5) sinking of the posterior wall, (6) œdema over the mastoid, (7) prominence of the auricle, (8) sleeplessness. Symptoms six and seven being seen only in advanced cases.

(1) *Aural discharge*: During the course of an acute middle ear condition when involvement of the mastoid occurs, it will be noted that the aural discharge becomes changed in character or amount. Usually there is a marked increase in the amount of the secretion and it will be noted that the elements of suppuration have increased, as evidenced by the marked increase in the pus cells as shown under the microscope. There is a certain class of cases of acute middle ear conditions in which the middle ear discharge during the entire course is of a serous nature. This may increase in some cases to a tremendous outflow but it has been our experience that so long as there is no change in its character the condition is not one to cause worry. Sudden lessening or cessation of the discharge indicates either obstruction or that the abscess has taken a different direction, and in either case there will be associated other symptoms. A study of the discharge is of prime importance in determining the type of infecting organism, and this infection so determined together with other associated symptoms becomes of immense value from a prognostic standpoint. The securing of cultures necessitates a very careful technique in order to obtain the true infecting organism. Cultures which we have frequently seen taken from the concha or external auditory canal are usually valueless and misleading, showing marked contamination by the staphylococcus and various unidentified bacteria. Our technique is as follows: All instruments used are sterilized, the external auditory canal is then cleansed as thoroughly as possible by irrigating with warm sterile saline solution, gentle aspiration is used and again the canal is irrigated. A cone of sterile cotton is then placed in the orifice of the external canal. After from ten to thirty minutes, depending upon the amount of discharge, the cotton is removed and under good illumination a small platinum loupe is carried into the canal touching only the secretion as it issues from the perforation. This is then carried to blood agar slants. In all cases an autogenous vaccine is prepared, to be used if needed.

To one who studies the aural discharge by culture it is often quite possible, after a certain amount of experience, to determine in many cases, from the character and color of the discharge, the type of infecting organism. We believe that from our study of the different types of infecting organisms, that certain of these present also typical clinical manifestations, and that further study may make it

possible to determine clinically the type of infecting organism. We have previously called attention* to the characteristics of the streptococcic infections and since that time, by noting these characteristics, have been able to diagnose streptococcic infections, which diagnoses were later proven by culture. (In chronic mastoiditis the odor of the discharge is of value in diagnosing the infecting organism.) Daily cultures are taken and the discharge examined microscopically.

Where the discharge flows freely without pulsation we would be prone to wait longer than where marked pulsation is present, as we believe the pulsation indicates obstruction within the additus.

(2) *Temperature.* In acute mastoiditis temperature is by no means a constant factor, and it is a question in many of the cases where a temperature of 101° F. or 102° F. is found, whether the temperature is not due to a middle ear condition in which the acute stage has not subsided, or due to the general infection caused by the bacterial invasion. How often we have seen cases of acute otitis media which have run a continuous temperature for many days in which, subsequently, the mastoid becoming involved, the temperature ranged around normal or 99.4° F. It is probable in such cases that the continued infection has brought about a state of active immunity, the blood recovering eventually its equilibrium. The reasons for the continuation of the condition in the mastoid are lack of local resistance under an anatomical arrangement within a bony capsule which does not allow drainage. A similar anatomical condition is seen in acute appendicitis in which, while the temperature may gradually reach normal, there will be found a walled off abscess of the appendix which is still active. Where temperature exists in cases of mastoiditis, therefore, we should think of it rather as a process which is so rapid that the blood cannot regain its equilibrium, or the infection too intense, or there has been an extension beyond the mastoid. Every otologist can well recall cases of marked destruction of the mastoid which have run practically without temperature. *The absence of temperature is certainly no guide as to the local condition of the mastoid.*

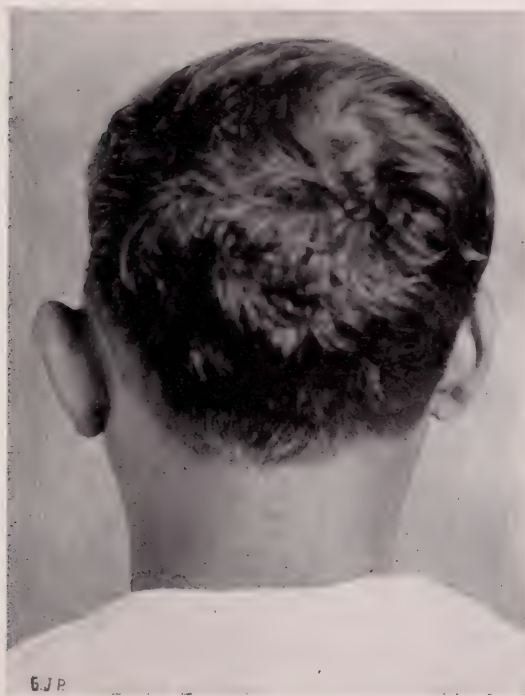
(3) *Pain.* The pain of acute mastoiditis is also preceded by a history of acute middle ear involvement. The pain which has occurred

*A Recent Series of Mastoid Cases, G. J. Palen, Jour. Opth., Otol. and Laryn., Feb., 1915.

during the middle ear condition in the majority of cases having subsided, the symptom recurs but is described at once by the patient as of a different character and in a different location. While that occurring during the middle ear condition may not subside still there is a sudden changing to the mastoid region. The intensity of mastoid pain varies, being due in many instances to the nervous character of the patient, while in others it is undoubtedly due to the degree of obstruction in the mastoid and the thereby increased amount of resulting tension. As the tension increases there results naturally an increase in the pain until rupture of the containing capsule takes place at the point of least resistance, this relieving tension. It is in this class of typical cases that we have the greatest pain, due to the fact that the tension and pressure are against the outer plate and produce irritation of the sensory nerve endings.

(4) *Tenderness.* With the occurrence of pain, tenderness can usually be elicited at some point over the mastoid, the location of this tenderness depending to some extent upon the anatomical structure of the mastoid, as this has a great deal to do with the areas involved. In the average case this is elicited first directly over the mastoid antrum, as this is the most intense point of infection. The second most favorable place is the tip of the mastoid, and the third over the mastoid emissary vein. The eliciting of these symptoms depends very largely upon the technique of examination. It is quite possible by slight pressure to get early an apparent tenderness over the entire mastoid due to cuticular irritation, therefore pressure must be deep and direct. There is a certain amount of normal tenderness, especially on the anterior surface of the tip of the mastoid, which the expert otologist at once differentiates from true pathological tenderness; he cannot mistake it for the "flinching" tenderness of mastoiditis. The increase or decrease of tenderness becomes of value in diagnosis and prognosis. Decreasing tenderness is almost invariably a sign of improvement.

(5) *Sinking of the posterior wall* of the external auditory canal close to the drum is indicative of mastoiditis. It is due to an exudate beneath the periosteum in the region of the mastoid antrum. This sign will, however, be lacking in a great many cases, and it is by no means an essential one. Its presence is positive, its absence is not



PLATES XXVIII and XXIX.—Anterior and posterior views of a case of typical acute mastoiditis.

negative. It is necessary to differentiate this condition from deep furuncle. This will be considered later.

(6) *Œdema of the mastoid.* After the pain and tenderness have persisted for a varying period, œdema occurs in the tissues over the mastoid process and the skilled examiner will recognize this early upon careful palpation. The œdema is not limited to the areas of tenderness. It increases gradually or rapidly, depending upon the nature of the disease process, reaching in some cases a high degree and it pits readily under pressure. As œdema increases the auricle is pushed forward and somewhat downward. The posterior surface of the auricle usually appears reddened and the cuticular folds are lost. The auricle appears thicker. Rupture eventually occurs through the outer plate; fluctuation is then felt with resulting marked:

(7) *Prominence of the auricle.* The clinical picture as outlined (see plates xxviii, xxix) (*i. e.*, œdema over the mastoid, prominence of the auricle) must be differentiated from that of acute inflammation of the external auditory canal in which the same clinical picture occurs. We have frequently had referred to us, on account of this clinical picture, cases for mastoid operation, in which it was easily determined that the condition was one of the external canal and not of the mastoid. The history in these cases is usually a marked aid in differentiating and the study of the symptom of pain is of positive value. In mastoiditis there is always a preceding history of a middle ear condition with otorrhœa, while the acute inflammatory condition of the canal is not usually preceded by an aural discharge. The pain of acute external otitis, however, is characteristic. It is markedly aggravated by motion of the jaw as in chewing; the auricle is extremely sensitive and any traction upon the auricle causes increased pain. These aggravations are lacking in mastoiditis.

(8) *Sleeplessness.* This is a symptom which will be found present in a large proportion of cases of mastoiditis, and it is one upon which we lay considerable stress from a diagnostic standpoint. Occurring as it does in many cases early the symptom is of even greater value. The sleeplessness as described by the patient has no direct connection with the pain, for even in those cases where the pain has been materially lessened by the use of the ice bag the sleepless condition still exists.

In the class of cases which we designate as typical, the tendency

of the process in the mastoid is through the outer plate above the insertion of the tip muscles, as occurs in the vast majority of acute cases, and this tendency accounts especially for the intense pain, the tenderness, the œdema and prominence of the auricle.

In our next classification, *atypical cases*, one or more of these typical symptoms (pain, tenderness, œdema over the mastoid) is lacking, owing to the fact that the anatomical structure precludes the spreading outward, the process working rather toward the inner plate or roof of the antrum, or toward the lower portion of the process below the insertion of the tip muscles, or anteriorly in the zygomatic region.

(1) Many cases are seen in which the pain and tenderness are absolutely lacking yet upon operation well defined, and in many cases advanced destruction of the mastoid is found. A careful study of the operative findings in such cases will show either a very dense outer plate or the process has broken through the inner plate. Some of the most serious cases which we have had have presented absolutely no pain or tenderness, so that we look upon the absence of these symptoms as of value in pointing to the possibility of extension inward; whereas, in those patients exhibiting typical tenderness and pain, we would look upon the condition as of less immediate gravity.

(2) *Pain or tenderness*, atypical in position. This is frequently noted over the entire surface or extreme lower portion of the tip in the beginning Bezold's type of mastoiditis or in the same type the tenderness may be noted on the posterior wall of the external canal close to the orifice. Again, we note in certain cases the occurrence of pain and tenderness referred anteriorly to the auricle in the zygomatic region due to the anatomical extension of the mastoid cells in this region and involvement of these. We have seen cases of this sort in which no symptoms or signs presented over the mastoid.

(3) *Atypical swelling and œdema*. While in the typical cases the œdema appears in the upper portion of the mastoid process or in children above the auricle, there are certain cases in which, owing to anatomical reasons and special areas involved, the œdema is lacking over the upper surface of the mastoid, but appears in other locations. In Bezold's mastoiditis the swelling appears suddenly in the retro-maxillary fossa or posterior to the tip, in other words, either anteriorly or posteriorly to the digastric fossa. The peculiarities of

this swelling are, its sudden appearance, coming on sometimes weeks after the subsidence of the acute middle ear condition; the absence of fluctuation, which is present in typical advanced cases, and also the associated masking of the mastoid tip due to the undermining of the tip muscles. In another form of Bezold's mastoiditis the swelling occurs on the anterior surface of the mastoid causing a narrowing of the external canal near the orifice. (We have reported* three series representing the different forms of Bezold's mastoiditis and reviewed the literature of this interesting condition.)

The second atypical location for the presence of œdema is in the zygomatic region in cases in which the process is active in the zygomatic cells.

(4) Atypical is that class of cases in which the mastoiditis exists with intact membrana tympani. This condition is frequently found in Bezold's mastoiditis, and we have reported such cases. (See papers on Bezold's mastoiditis.)

A study of the clinical symptoms and signs occurring in these atypical cases and the knowledge that they do occur is of extreme value in order that the cases may receive early proper attention. We have in our experience met with many cases where these conditions were not recognized as of mastoid origin, because of their relatively rare occurrence as compared with typical cases.

Symptoms denoting extension. It is our rule while treating mastoid conditions to keep our patient under careful observation for any deviation from his general condition, this including thorough neurological and ocular examination. In discussing our present head it is not our intention to reiterate what has been so often and so well expressed by others who have written upon the serious complications of mastoiditis, but rather to mention simply some symptoms which we have observed but have not often seen described, and which we feel are of value in recognizing the extension of the mastoiditis or possible occurrence of some one or other of the serious complications.

(1) We have frequently noted a type of headache referred to

*Bezold's Mastoiditis, A Series of Cases, G. J. Palen, Hahnemannian Monthly, Jan., 1911.

" " A Further Series of Cases, G. J. Palen, Hahnemannian Monthly, May, 1911.

" " A Third Series of Cases, G. J. Palen, Jour. Ophthal., Otol., Laryng., Jan., 1915.

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the frontal region upon the same side as the lesion and from careful study of our cases have come to look upon this as suggestive of an erosion of the inner plate with exposure of the dura of the middle fossa.

(2) Photophobia is a symptom often encountered, and we have found it of marked aid in connection with other symptoms. We have noted this symptom not only in beginning meningeal conditions but have also observed it in a number of cases of sinus thrombosis. In a recent case it was a very marked symptom and associated with a high state of mental unrest.

(3) Close attention must always be given to the mental condition of the patient to determine whether there is a mental excitability or the converse of this, apathy. The occurrence of either of these conditions is extremely suggestive of deeper involvement. By close observation we will early recognize the slightest deviation from the patient's normal mental balance.

(4) The patient exhibiting a desire to get out of bed, or to so lie upon the bed that one or other of the limbs is extended beyond the bed, should be carefully watched. This symptom is extremely suggestive of meningeal involvement.

(5) Unilateral epiphora is suggestive of involvement somewhere along the facial nerve. We have noted this as a premonitory symptom.

We do not here go into the condition of the blood during acute mastoiditis as this will be taken up in one of the other papers. We wish simply to state that repeated examinations are made, and we feel that much of value can be learned by such examinations when taken into consideration with associated symptoms.

In every case where possible an X-ray is taken. We have found it of great aid in the diagnosis of suppuration and of destruction in the mastoid.

TREATMENT.

Believing as we do that a large majority of the cases of acute mastoiditis are due to improper treatment of the preceding acute middle ear condition, it becomes necessary, under the head of prophylaxis, to consider briefly how this condition should be treated.

We look upon the middle ear condition as one which, if possible, should be under the care or supervision of a competent specialist.

As good drainage is the keynote to the successful resolution of these acute conditions, a properly performed incision of the membrana tympani is an early essential in the treatment and will shorten very materially the course of the disease. Cases of acute otitis media coming to us within the first twenty-four or forty-eight hours very rarely go on to the stage of mastoiditis. After the incision is performed it is of greatest importance to daily view the membrana tympani and make sure the incision is not closing; in other words, make sure of constant free drainage. The average case is unfortunately allowed to rupture spontaneously, the lining tissues of the middle ear and mastoid, therefore, subjected to severe tension for some time, thus causing local lack of resistance, and even after spontaneous rupture has occurred the opening is usually so small that tension continues. *If the physicians in attendance upon cases of acute otitis media will firmly realize the importance of early and wide open drainage the future will find many less cases of mastoiditis.*

In the care of cases of acute mastoiditis the first question which arises is, *have we already an operative case or are the symptoms such that we are guaranteed in attempting some local curative measures?* What are the symptoms or signs which we believe guarantee immediate operation?

(1) When we are satisfied that a purulent mastoiditis is established we deem a mastoid operation imperative and would so advise. We, therefore, lay great stress upon the *character and amount of secretion*, for we believe that the study of the discharge is of prime importance in deciding when to operate.

(2) If during the course of a middle ear condition, which has been running the usual course, pulsation developed with change in the character of the secretion we would look upon this as a sign for operation.

(3) The sudden cessation of a profuse discharge should necessitate operation.

(4) In certain cases the discharge is changed in character although not profuse, but the associated symptoms, pain, tenderness, sleeplessness, etc., are such that we look upon the condition as a possible obstructive one and we would here advise operation.

(5) Increasing pain and tenderness in connection with changed character of secretion demands operation.

(6) As soon as cedema occurs the mastoid should be opened, and this especially in adults. This stage having been reached it is seldom that resolution occurs.

The above we consider the imperative symptoms in a typical case. Sinking of the posterior wall, while evidence of a mastoiditis, is not in itself a symptom necessitating operation, but becomes so only in association with other symptoms; changed secretion, increase in pain, etc.

A positive X-ray associated with other symptoms, such as change in character of secretion, increase of pain or tenderness suggests operation.

The character of infection is of value in determining the necessity for operation; we would delay longer with the staphylococic than with a streptococic.

In the atypical cases operation should be performed at once. In Bezold's mastoiditis, for instance, the swelling in the neck shows that there is a perforation of the mastoid capsule.

The occurrence of cedema and tenderness in the zygomatic region should receive immediate attention because of the increased danger at this point from intercranial involvement.

We realize that the above statements may seem to some extremely radical. We believe, however, that anyone who thoroughly considers the anatomical structure of the mastoid, and who realizes the variations in the structure and the density of its plates will admit, at least, that once a purulent mastoiditis is established further delay in opening the mastoid capsule subjects his patient to a certain risk. He must so admit for he knows that he has at command no positive way to determine the resistance of the walls of the mastoid capsule, and, therefore, cannot absolutely know what direction the pus will take. *Is there any other suppurative surgical condition which when determined would not be immediately drained?* We should not allow the natural desire of the patient to avoid an operation nor should we allow any timidity which we might have for performing the operation to influence our judgment, for we know that a properly performed mastoid operation, where no deeper complications already exist, stops the process and is not injurious to the patient.

In what class of cases then would local treatment be deemed advisable? Cases which, while presenting the symptoms of pain and tenderness, show no change in the character of the secretion or cases

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in which, while the discharge may be excessive it is of a serous nature or mucoid, are those which are suitable for local treatment.

Any such case should be at once put to bed, elimination through the bowels and kidneys and skin should be looked after; the patient placed upon a light sustaining diet. If the drum is not thoroughly opened, free incision should be made through the perforation under thorough aseptic conditions and an ice-bag placed over the mastoid region. If the discharge is of a mucoid character it will be necessary to use warm irrigations every two or three hours, depending upon the amount of the secretion, in order to prevent the damming up of same; but if the discharge is of a serous nature it is far better to avoid any other local treatment than simply the use of pledgets of cotton placed within the external canal and removed as frequently as necessary. If after twenty-four hours there is no change in the character of the secretion the treatment can be safely continued, or if we find that there is less tenderness and pain and the secretion has lessened in amount the ice-bag may be removed and after a period of six hours can be replaced upon the mastoid for a further period of a few hours. We realize that certain otologists claim that the ice-bag when once removed should never be replaced, but we have yet to see any deleterious effects from doing so, while, on the other hand, we are sure of the beneficial effect. During the course of the case the membrane is inspected carefully at each visit in order to make sure that the opening is sufficiently large for good drainage. If the discharge changes in character and becomes purulent we would at once advise operation.

In chronic suppurative conditions of the middle ear or mastoid we have had good results from vaccines but have seen little results in acute conditions.

OPERATIVE TREATMENT OF ACUTE MASTOIDITIS.

As a detailed description of our operative technique would be simply a repetition of much that has been written by others, we shall not enter into this, but wish only to express our views concerning certain details which to our mind are important in securing a good ultimate result.

We are careful to carry our incision through the periosteum with

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our first cut and then exercise great care in preserving this intact, for the periosteum has a great deal to do with rapid and perfect wound-healing.

The anterior flap is carried only far enough forward to expose the spine of Henle without separating the membranous canal from the bony wall. Often too little care is exercised in this and there results a narrowing of the posterior canal wall near the orifice which sometimes remains permanently.

After properly exposing our bony field our next step is to open the mastoid antrum. We do not believe that it is good technique to work from below upward to the antrum as we have seen some operators do. Once the antrum is located we immediately know the position of the other important structures and are in a position to work more rapidly and successfully. In opening the antrum we start with a gouge, continuing this until cellular structure is encountered when a small curette is used to enter the antrum, care being used to keep the cutting edge toward the external canal. In this way the antrum is quickly reached, and even were the lateral sinus placed forward the belly of our curette would encounter it and pass by it.

After removing two or three strips from the mastoid cortex and exposing the contents of the mastoid capsule we then work with a curette and ronguer under the outer plate until the inner plate is encountered in all directions, and by this method we feel that all cellular structures will be uncovered. Complete exenteration of the bony cells is the important thing in mastoid surgery, and we are not satisfied until this is accomplished. Where a dural or sinus exposure is found we extend the bony opening until we are satisfied we have reached healthy bone. If we find reason for open wound treatment, such as doubtful granulations upon the sinus or dura, the wound is packed loosely with iodoform gauze.

Recently we have made use of the blood clot and have been highly pleased with the results. Three recently operated cases in which we used this method have shown complete wound-healing on the eighth, tenth and eleventh days. Our experience with this method is too limited to speak with assurance. We take great care of the after-treatment of our mastoid cases, realizing the extreme importance

of the proper after-care as will be shown in a following paper by Dr. Clay.

THE BACTERIOLOGY AND VACCINE THERAPY OF MASTOIDITIS.

WHAT are the infecting organisms in mastoiditis? By what means, directly or indirectly, can they be identified for diagnostic and therapeutic purposes? What is the diagnostic and therapeutic value of this knowledge? To answer these questions is to state the bacteriology of mastoiditis and the office of vaccine therapy in the condition.

It will hardly be disputed that mastoiditis is nearly always the result or sequel of otitis media, acute or chronic. It is true that idiopathic mastoiditis has been described by observers, as, for example, Dabney,¹ who reported two cases of his own and collected twenty-four others. But in the vast majority of cases the otitis is only too obvious and the aural discharge presumably contains the same strain of organism which invades the mastoid. The purulent ear discharge, therefore, furnishes an indirect method of observing the bacterial cause of mastoiditis. When the mastoid is operated on, one has a direct method of diagnosing the causative microbe. And finally, when the infection spreads beyond the mastoid and gives rise to sinus thrombosis and meningitis, the organism may be isolated from the blood-stream and indirectly identified as the cause of the mastoid abscess.

The direct recovery of the bacterium from the mastoid pus at operation is naturally the most accurate method of ascertaining the role of various micro-organisms in causing this condition. With few exceptions, it is a safe assumption that the organisms present are etiological factors. And when the figures are from a reliable source, they may be taken as a statement of the bacteriology of mastoiditis. Such figures are furnished by Dwyer,² who, in an analysis of cultures taken from the mastoid of one hundred and seventy-four cases, found "the streptococcus hemolyticus was present in about 65 per cent.; the streptococcus viridans in 5 per cent.; streptococcus mucosus capsulatus in 20 per cent.; staphylococcus pyogens aureus in 8 per cent.,

and the balance comprised infections with bacillus mucosus capsulatus, bacillus pyocyaneus, pneumococcus and bacillus diphtheroid." Two organisms were isolated in ten cases, the streptococcus being one of the two in all but two cases. The presence of the bacillus proteus has been mentioned by some observers as an occasional finding. We are inclined to think that in a number of instances, the staphylococci, bacilli pyocyaneus and the diphtheroids are present only as saprophytes or complications, the real causative streptococcus having died out or been overlooked. Whether this is so or not, it is quite plain that mastoiditis is overwhelmingly a streptococcus infection, considering all varieties of streptococci as one class. Thus it was present in 90 per cent. of Dwyer's series.

The indirect bacteriologic diagnosis of mastoiditis through examination of the otitic discharge is much more easily carried out but findings are far less reliable. This is easy to understand when one considers the normal abundant bacterial flora of the external ear and the variety of organisms in otitis, especially the chronic form. However, with proper precautions a good technician may secure satisfactory results. Haskin³ gives good advice in this respect. He says, "We now first cleanse the canal with a vacuum cleaner, sucking out all visible secretions from the attic and Eustachian tube. Then a pledget of cotton saturated with alcohol is packed in the canal and kept there for five minutes. If the perforation is large enough the sterile platinum loop is introduced into the attic and any secretion is transferred immediately upon blood acetic agar plates. If the perforation is small the Siegel otoscope is used to draw into sight any secretion there may be, and transfer is then made. A slide is then smeared with secretion obtained on a cotton covered applicator." In a careful study of the bacteriology of otitis media, particularly the acute forms, Libman and Celler⁴ examined 277 cases. They found the streptococcus present alone or with organisms in 81.46 per cent. of cases, the streptococcus mucosus in 10.34 per cent., and the pneumococcus in 8.2 per cent. Other organisms found were the staphylococcus bacillus pyocyaneus and bacillus proteus. Mixed infections were not uncommon. It will be seen, however, that streptococci were present in over 90 per cent. of cases, corresponding closely to the mastoid findings. Other investigators, especially the earlier ones, did not report such a high percentage of streptococci. Their findings and

technic, however, are in a number of cases open to question. It is very probable, too, that the streptococcus mucosus was previously frequently classed or confused with the pneumococcus. In chronic otitis the findings are more varied than the acute form. Dwyer⁵ in 53 cases of chronic suppurative otitis found the staphylococcus aureus, 17 times; the staphylococcus albus and citreus, 6; the streptococcus mucosus, 8; streptococcus hemolyticus, 8; pseudo-diphtheria, 15; bacillus pyocyaneus, 16; bacillus proteus, 5; bacillus of diphtheria, 1; bacillus mucosus capsulatus, 3. It is also to be noted that anaerobes have been worked out in culture and various spirochetes found in spreads. Their significance is uncertain. It must be said that the foregoing findings are not the usual ones when mastoiditis is threatening or imminent. Streptococci are then not difficult to isolate.

Bacteremia in mastoiditis is of double value to the clinician. It indicates the bacterium which is infecting the mastoid, and it signifies, with certain reservations, a sinus thrombosis or a meningitis. In 43 cases of sinus thrombosis, Libman⁶ obtained positive results from blood cultures in 80 per cent. Of these positive cases, streptococci were found in 90 per cent., streptococcus mucosus in 8.8 per cent., and the bacillus proteus in 1.2 per cent. Thus, streptococci were the cause of sinus thrombosis, and, therefore, of the mastoiditis in 98.8 per cent. of this series. This is a higher percentage of streptococci than Dwyer isolated directly from the mastoid, which may mean that the sinus is invaded when the infection is due to the more virulent organisms. In 17 cases of meningitis complicating mastoid disease Libman obtained positive results in 53 per cent. Of these six streptococcic meningeal infection gave two bacteremias, three cases of pneumococcic meningitis gave one, and the blood cultures were positive in six out of eight cases of meningitis due to the streptococcus mucosus.

The significance of bacteremia in otitic cases is of great importance. According to Libman positive blood cultures in otitis media and mastoiditis are obtained only when sinus thrombosis (including bulb thrombosis) or meningitis is present. If meningitis or other causes for a bacteremia can be excluded, one may assume from a positive blood culture that sinus thrombosis is present. And this holds good either before or after operation on the mastoid. This view has been opposed by Duel and Wright,⁷ who, employing a special

method, found bacteremia relatively frequent in uncomplicated cases of otitis media and mastoiditis. Libman made blood cultures in 149 cases of otitis media and mastoid disease uncomplicated by meningitis or sinus thrombosis. Some of these were complicated by epidural and brain abscess. In all cases, however, the cultures were negative. Libman also used the technic described by Duel and Wright but was unable to get positive results. It is also noteworthy that Page,⁸ from the same institution where Duel and Wright did their work, reports results confirming Libman, as do also Drs. Dixon and Hays, from the New York Eye and Ear Infirmary. Libman acknowledges that there may possibly be cases of uncomplicated otitis or mastoiditis, especially in children, exhibiting bacteremia, but he seems to be on safe ground when he says that in case of bacteremia the surgeon should take it for granted that sinus disease is present. He then may operate or not according to his judgment of the individual case.

It will be noted that positive cultures were obtained in 80 per cent. of Libman's series of sinus thrombosis. Theoretically, all cases of sinus thrombosis show a bacteremia at some time. There are many reasons for negative results; improper technic, organisms too few, cultures made too early or too late, intermittency of the bacteremia, etc. These must be taken into consideration in concluding the blood is sterile. On the other hand, in adjudging a bacteremia as due to sinus thrombosis, all other possible sources of infection in various parts of the body must be excluded. Practically, this is seldom difficult. Repeated negative cultures are of value in excluding sinus thrombosis and also as indicating the disappearance of the organisms after operation and ligation of the jugular.

The role of the streptococcus mucosus capsulatus in aural infections is noteworthy. Dwyer found it present in 20 per cent. of cases of mastoid disease and in about 15 per cent. of cases of chronic suppurative otitis. Libman isolated the streptococcus mucosus in 10.34 per cent. of 277 cases of otitis media; in 8.8 per cent. of 34 cases of sinus thrombosis, and in 47 per cent of 17 cases of meningitis complicating mastoid disease. Suepflé⁹ in a 100 cases of otitis recovered the streptococcus mucosus in 14 per cent. Wittmaack¹⁰ thinks the capsulated streptococcus even more frequent in primary otitis media than other streptococci. Infections with this organism are

more or less peculiar. Perkins¹¹ concludes that this germ has a special affinity for bone tissue, and Suepfle remarks upon its deleterious effect upon bone. Welty¹² speaks of infections with the streptococcus mucosus as very insidious, and says, as a rule, there is not a sharp, acute infection. The patients may have little or no elevation of temperature and little or no pain, yet these apparently mild cases may develop the more serious complications. Graham,¹³ in discussing Welty's paper, says the streptococcus may remain dormant for many months and be responsible for a number of delayed mastoid cases operated on as primary mastoiditis. The symptoms are obscure and may be overlooked by the general practitioner. In a case of Dr. Palen's with normal temperature and indefinite symptoms, the mastoid contained a very large amount of pus from which was isolated the streptococcus mucosus. Later this patient developed a tonsillar abscess from which the streptococcus mucosus was also recovered.

The observations of many competent and conservative otologists would seem to speak for the positive value of bacterial vaccines in otitic and mastoid conditions. If the vaccines are positive factors in the cure of acute and chronic otitis media, and there is considerable evidence in favor of this view, they can be logically regarded also as preventive agents in the mastoiditis which follows the otitis. Further, their use in mastoiditis, both pre- and post-operative has been followed by favorable results. We certainly do not approve of the unintelligent and indiscriminate use of vaccines, but this applies just as well to drugs or any other therapeutic agent. And with an average amount of intelligence and ordinary care, the physician should be able to employ these remedies with advantage in many cases and, at least, without doing harm where positive results fail.

The selection of a vaccine should be based on the bacteriological diagnosis of the case. Though the assumption that the infection is streptococcic will be correct nine times out of ten, it is much better to determine exactly the causative organism through examination of the ear discharge, the mastoid pus or blood culture. One is pretty safe in concluding that the bacteriological findings of the blood or mastoid indicate the cause of the infection, but the spreads and cultures from ear discharges usually reveal many organisms, and judgment and experience are required to say which is the active factor. Organisms of the streptococcus class are much more likely infectors

than others even when of the pathogenic class. The cause determined an autogenous vaccine should be prepared whenever possible and practical. If a stock vaccine is employed, it should be the same type of organism as that acting in the case to be treated. Thus the streptococcus hemolyticus, viridans or mucosus should be employed in the respective infection. Furthermore, the various streptococci and other bacteria of the stock vaccine should have been isolated from ear and mastoid infections and not from other parts of the body. Where a bacteriological diagnosis has not been made, one may hazard a stock streptococcus vaccine or the mixed vaccines of the drug houses, but such methods are not to be encouraged. While waiting for the preparation of an autogenous vaccine, the proper stock vaccine may be used.

The dosage of streptococcus vaccine varies from 50 to 300 million or more with most observers. We have, as a rule, employed smaller doses with satisfactory results. An initial dose of 10 to 20 million is given and raised to a maximum of 50 to 60 million. The more severe the infection the smaller the dose. With a sharp, acute infection we have preferred giving doses of ten, or even five, million streptococci daily rather than larger doses at two to four days' intervals. The local and general reaction are guides to the dosage and interval, though caution is necessary in interpreting general reactions as due to the vaccine. Staphylococcus vaccine is given in larger doses from 100 to 1,000 million. Altogether, the dose is less important than selection of the proper vaccine based on the bacteriological diagnosis. The preparation of an autogenous vaccine need not be as time-consuming as is popularly supposed. The organism of a given case may not infrequently be cultured and made into a vaccine within twenty-four hours. In a case of Dr. H. S. Weaver's, the patient suffered a mastoiditis complicated by a sinus thrombosis. The blood culture was positive, and from the streptococcus of this culture the vaccine was ready in eighteen hours. Its use was followed by prompt relief of the patient's serious symptoms and recovery without operation on the sinus. We would not, however, for a moment wish to give the impression that vaccine therapy replaces operation. We consider it an adjuvant therapeutic method of value, with possibly a prophylactic action as regards mastoiditis when used in otitis media.

SUMMARY. The infecting organisms of mastoiditis are in over

90 per cent. of cases of the streptococcus class. Of these, the streptococcus hemolyticus and the streptococcus mucosus capsulatus are of particular interest. The bacteriological diagnosis may be made directly by examination of the mastoid pus or indirectly through cultures of the blood and examination of the ear discharges. Vaccine therapy should be based upon the bacteriological diagnosis. If possible an autogenous vaccine should be employed. If not, a stock vaccine made from the same variety of micro-organism causing the infection may be used. The results indicate a positive value for the method.

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ROENTGEN RAY AS A DIAGNOSTIC AGENT IN MASTOID DISEASES.

THE use of the Roentgen ray in diagnosis has been one of steady progress since its discovery. Soon after this it was successfully applied in the diagnosis of fractures and dislocations; later in the location of foreign bodies, in the detection of bone diseases, and still later in the detection of tumors, diseases of the soft structures, diseases of the chest, urinary calculi, biliary calculi and, with the bismuth meal, in diseases affecting the gastro-intestinal tract. Further, its use widened to the detection and location of diseases of the

frontal sinuses, antrums of Highmore, sphenoid cells, mastoids and teeth.

It is my purpose in this communication to point out the possible advantage, as well as the source of error, in the use of the Roentgen ray in the diagnosis of otological diseases.

The Roentgen ray is used as a routine method in examining otological pathology and especially in determining the need of surgical interference. Many cases of mastoid disease are easily recognized, and the indications for operation are so plain that no one need make a mistake. But it is the unusual case, the one that presents certain symptoms pointing toward a mastoid involvement, but where, nevertheless, there are certain other symptoms that may point toward other conditions in the immediate vicinity, in which the use of the Roentgen ray will be effective in differentiating the condition present. In order that it may become of value the examination should be very carefully made. The proper exposure, proper orientation, in fact, the technique should be perfect in every way, and the interpretation must be very carefully made.

The technique which I find to be very good is the following: Stereoscopic examination made of both mastoids; the well mastoid is also included as a means of comparison and to check up the abnormalities that may be present.

The patient is placed prone on a table with the head turned to either side depending upon which one is to be Roentgenographed. The plate is placed underneath the patient's head which is held at an angle of from 22 to 25 degrees. The rays pass perpendicularly through the head entering the skull about two inches above the highest point of the opposite pinea, a tube of sufficient penetration being used. An exposure of from 3 to 5 seconds with thirty milliamperes of current is made. I have found the antero-posterior position, as recommended by Dr. Hickey, of Detroit, to be very helpful in some cases, but I rely especially upon the stereoscopic Roentgenograms made with the head in the lateral position. With proper technique of exposure and development a mastoid condition can be readily recognized.

The application of the ray is two-fold. First: As a general routine in all cases of ear disease to discover, if possible, any infection in the mastoid or beyond the middle ear; or to differentiate from some other condition in the immediate neighborhood having

some resemblance to a mastoid condition; or in some cases in which there are no distinctive indications of mastoid condition, and we want to eliminate the possibility of the condition being present. Second: As an aid in the unusual middle ear condition that extends into the mastoid.

Interpretation: In the interpretation of a Roentgenographic lesion, as shown about the mastoid, the classification which I find to be fairly good and to meet our requirements is the following:

The conditions are divided into three main divisions—

- A. Acute.
- B. Chronic.
- C. Healed.

Of acute conditions we have three distinct types.

1st. Mild or first degree mastoiditis in which we find the mastoid cells are rather hazy, no destruction of bone but the trabeculae and the walls of the cells are not distinctly marked. This is due to the fact that the cells contain fluid, serum or pus, instead of air.

In the second degree we have in addition to the cloudiness, distinct changes in the bone structures. The cell walls now are distinctly hazy, and in places they may be broken down throwing groups of cells into one, the result being a lack of definition in the mastoid outline. These changes may resolve spontaneously, but a great majority of them will not but simply progress to a necrosis. A certain number of these cases may go on to a complete cure by the expectant treatment, while the balance will demand operative treatment. In these border-line cases there is always great danger of error in interpreting the Roentgenograms. It is only after the study of a great number of cases that we are able to draw the final conclusion. It must be remembered, however, that these cases, from a clinical standpoint, are very difficult of differentiation and any help derived from the Roentgen ray along this line, will be appreciated by the otologist. As a general rule these cases demand operative interference to drain the accumulated pus, although, as stated above, a certain number will go on to a cure without this.

In the third type of acute mastoiditis the bone is completely destroyed over large areas, probably involving the majority of the mastoid cells, the inner plate over the sinus and extending into the zygoma. Sometimes we are able to localize the first area which

begins to necrose. This may be remote from the mastoid, it may be in the mastoid or may be among those cells surrounding the middle ear. This class of cases always demands immediate operation because of the great danger of cerebral complications. This is very apt to happen in the subacute type where the symptoms have lasted over a number of weeks without giving rise to any urgent indications of the extent of the lesion. These so-called neglected cases very frequently are seen in the out-patient department or from the out-lying district, and have not been brought to the specialist until marked extension of the necrotic condition of the mastoid has occurred. The early Roentgen examination practically confirms the diagnosis and gives the otologist the clue as to what is necessary in order to take proper care of the patient.

B. The chronic case. The chronic cases are divided into two distinct classes.

1st. The simple sclerosis. This is practically a healing process. However, nature has taken care of the diseased area and tried to wall off the infection. In so doing all cellular structure may be lost. This is so when the primary infection occurs early in childhood before the mastoid has developed properly. We frequently find these conditions in older children or adults in which the mastoid is undeveloped and show these sclerotic changes. If there are any chronic ear symptoms associated with the mastoid or if there is an acute process engrafted upon a healed one, it may be rather difficult to make an accurate interpretation of the Roentgenogram.

It is rather rare to find a sclerotic mastoid involved in an acute inflammation. If an acute inflammation does occur it is usually limited to the middle ear and does not involve the sclerotic mastoid, and there is very little danger of the process extending to the mastoid on account of the sclerosis present. If the case presents the usual ear symptoms, discharge, auditory disturbance, etc., of a chronic nature and the Roentgenogram shows a sclerotic mastoid the cause of the disturbance is usually found in the middle ear, such as granuloma, chronic in character, etc., rather than a change in the mastoid itself. However, in this class of cases, as mentioned above, improper interpretation is apt to creep in.

If we have a sclerotic mastoid with bone cavities or defect the Roentgenograms would be similar to those of the simple sclerosis except

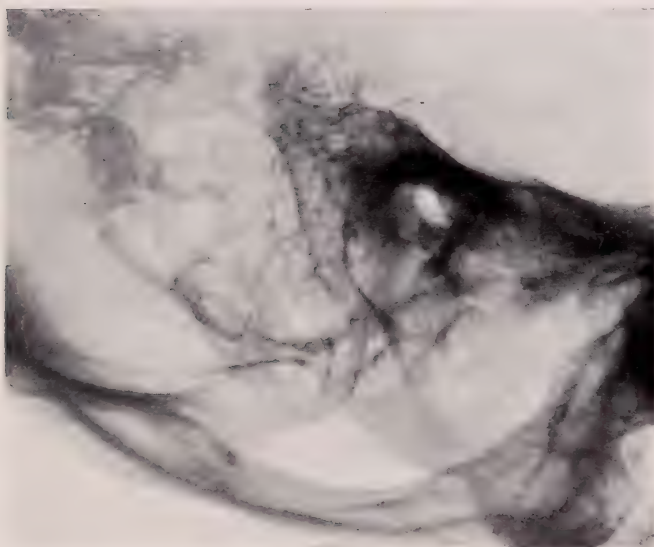


FIG. 1.—Roentgenogram of the normal dried mastoid showing the mastoid cells, a groove for the lateral sinus and the cells about the petrous portion of the temporal bone.



FIG. 2.—Normal mastoid of a living subject.

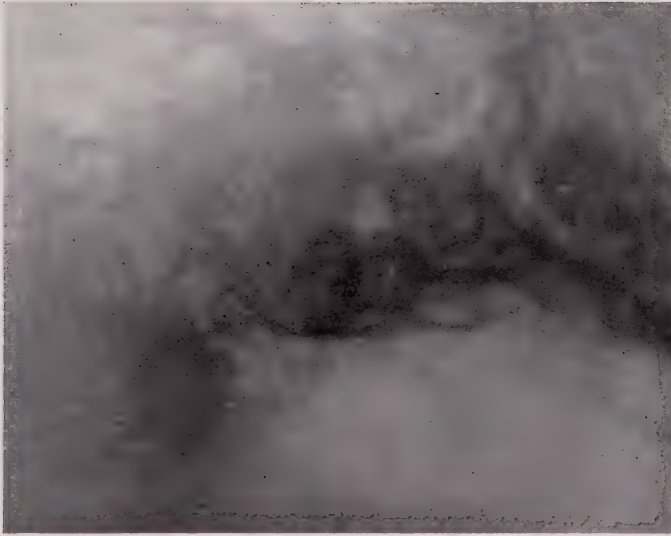


FIG. 3.—Acute mastoiditis without bone destruction showing a simple congestion and haziness of the mastoid trabeculae and also of the cells about the petrous portions of the temporal bone.

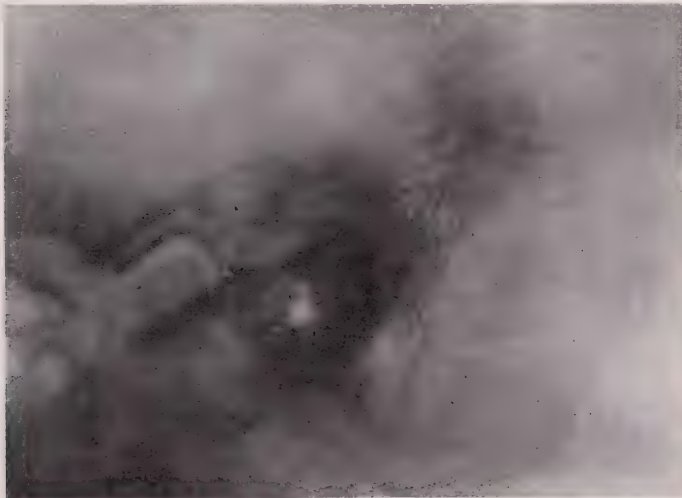


FIG. 4.—Second degree of acute mastoiditis in which we have bone destruction and the groove for the sinus becomes more prominent.

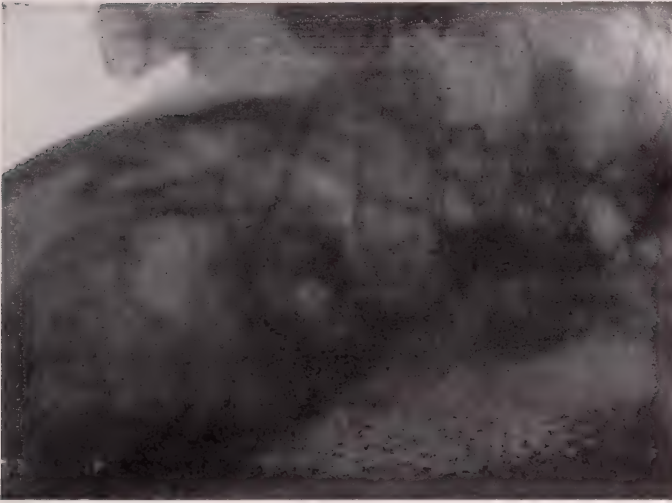


FIG. 5.—Third degree of acute mastoiditis with marked abscess formation in the mastoid.



FIG. 6.—More advanced stage of third degree mastoiditis with marked necrosis of both the mastoid cells and those cells surrounding the middle ear.

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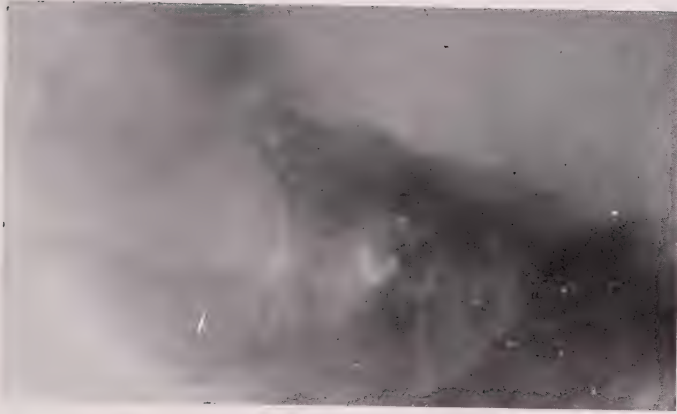


FIG. 7.—A border-line case in which sclerosis is taking place following an infection without necrosis.



FIG. 8.—Sclerotic mastoid showing a very prominent groove for the lateral sinus; some of the cells present in a normal healthy condition.

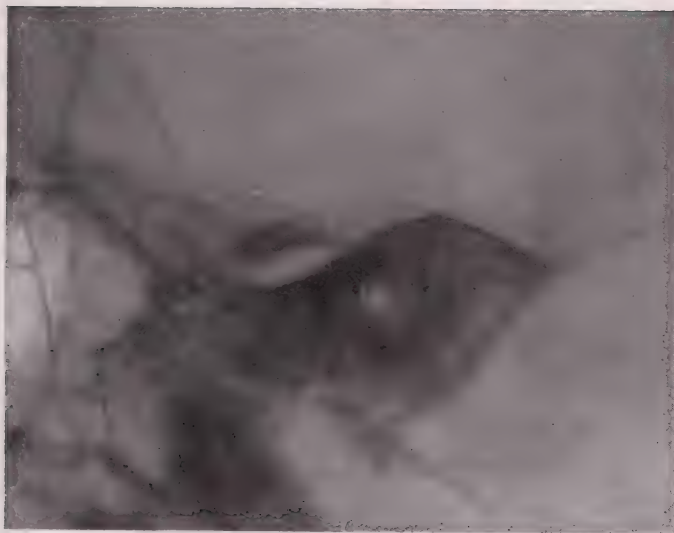


FIG. 9.—Sclerotic mastoid (healed) with practically all of the cells destroyed. Note the sharp groove for the lateral sinus.

that the necrotic area of less density is surrounded by sclerotic bone. Such cavities may result from incomplete sclerosis and are apt to occur in chronic cases, if they do not have free drainage, or probably due to a cholesteatoma formation. In either case a simple pocket of pus may be a source of constant drainage unless blocked by granulation or polypoid material. The formation of a cholesteatoma usually results in a destruction or hollowing out of the whole mastoid, the remaining bone tissue being reduced to a mere shell. These cavities usually stop in the mastoid and are due to the enlargement of the graphic plate.

When these conditions are found it indicates the necessity for surgical interference and for this reason they should be searched for very diligently. It is possible, at times, for the sclerotic condition of the mastoid to conceal these necrotic areas and the interpretation of a simple sclerosis is made when we have a sclerosis with cavitation, which demands operative interference.

THE NON-OPERATIVE TREATMENT OF ACUTE MASTOIDITIS.

THE treatment of middle ear and mastoid infections is a difficult problem and depends largely upon experience and accuracy in diagnosis as to when medicinal treatment alone is sufficient, or when it no longer is a case for drug action but one for the aural surgeon. The character of the infection, when ascertained early, will be of great value to the physician in outlining his treatment; how long it is safe to continue with non-operative measures and offer the patient the best chances for a recovery, with the least damage to the hearing apparatus.

Many cases of acute mastoiditis are successfully treated without operation, and others are allowed to drift along until serious or even fatal complications arise before operation is recommended. All cases of acute mastoiditis treated by non-operative measures must be carefully watched and should the symptoms, even though they seem slight, fail to respond promptly, operation should be considered before complications arise which endanger life.

The streptococcic infections of the mastoid are more virulent in character than the staphylococcic or the pneumococcic; therefore, an

ACUTE MASTOIDITIS.

early diagnosis of the infection will aid the physician in outlining his treatment.

Nature herself is a very good physician, and in many of the acute cases does all that is required in the way of surgical intervention by spontaneous rupture of the membrana tympani, allowing free drainage from the affected mastoid; but it is not wise or safe to wait for nature to establish this drainage when you see the case early and you know that the drum cavity and mastoid cells contain pus. The drum membrane may be sufficiently strong to resist spontaneous rupture until deeper and more serious complications arise which will require more radical operative interference.

In the treatment of these cases it is well to consider them under two classes or rather two stages.

1st. The acute or congestive stage, and it is in this stage that the indicated remedy proves the most efficacious.

2nd. The exudative stage, when serum or pus is found in the middle ear and mastoid cells.

In all cases of acute mastoiditis, especially during the early or congestive stage of the disease, when the parts are extremely hyperemic, there may or may not be exudation within the cells; the application of light and heat as produced by a high candle power electric bulb, with a reflector, applied directly to the parts as near as can be borne without distress, will limit the inflammation and greatly relieve the pain.

These applications should be made for a period of thirty minutes to an hour, depending upon the tolerance of the patient, and may be repeated two or three times per day. The pain and congestion many times after the first application will show a decided improvement, and when used early in the attack before the formation of pus will bring about a rapid resolution of the inflamed areas. Heat alone will be of service, but in my hands has not proven as efficacious as the heat and light combined as obtained by the electric bulb and reflector. In some cases the application of heat in any form will aggravate all the symptoms, and the use of cold is more soothing to the patient. In these cases the application of the ice-bag or cold coil are best; but care and judgment must be exercised in using either, owing to the relief of external soreness obtained, which may mislead the physician as to the deeper complications that are not recognized or overlooked

by the apparent superficial relief obtained by the cold. The use of an ice-bag should not be encouraged unless recommended by the physician, in any case of acute mastoiditis, because the relief of external soreness, as solicited by pressure over the mastoid, may mislead the attending surgeon as to the pathological changes within the mastoid cells.

In the acute or congestive stage the remedies most applicable are, Aconite, Gelsemium, Belladonna, Apis mel., Capsicum, Bryonia, Hepar sulph., Chamomilla, Natrum carb., Aurum met., etc.

ACONITE. One of the first remedies to be thought of, especially well indicated when the patient has taken cold from a sudden drop in the temperature, or has been exposed to cold westerly winds. Has sharp pain in the ear and mastoid. Is restless, nervous, anxious, fearful. Dry skin, and if aconite is prescribed, when the perspiration starts the remedy should be given at longer intervals or discontinued for a time to obtain the best results.

GELSEMIUM. The gelsemium patient differs from the aconite in that we have a history usually of taking cold from dampness or getting chilled when overheated or when perspiring. The patient has chilly creeps up and down the spine, is mentally sluggish, sleepy, has occipital headache and soreness in the eyeballs. All the above symptoms just immediately precede or are associated with a beginning middle ear and acute mastoid involvement.

BELLADONNA. In all acute congestive cases with throbbing or pulsating pains. Skin flushed and dry but moist in areas. May have moist forehead, neck or ears, etc. Pain, which is sharp and severe, comes on suddenly and disappears just as suddenly. Congestive headache, photophobia, dilated pupils, sensitiveness to light and noise. Pharynx usually congested. Throbbing carotids.

APIS MEL. Especially useful when acute otitis with mastoiditis follows scarlet fever, complicated with an acute nephritis with scanty or suppressed urine. The ear and mastoid are extremely sensitive to touch and all the symptoms are aggravated by the least motion of the jaw.

CAPSICUM. Sharp neuralgic pains in the mastoid with redness and sensitiveness over the mastoid tip. Extremely tender to touch. Redness and burning over whole mastoid. The best results are obtained by using this drug in potency not lower than the third or sixth.

ACUTE MASTOIDITIS.

BRYONIA. Sharp knife-like pains in the mastoid cells and the ear, associated with a frontal headache; all the pains worse upon the slightest motion of the head; may or may not have vertigo upon motion. Dry skin, dry mouth, coated tongue and usually thirsty for large large quantities of water.

HEPAR SULPH. Useful before and after suppuration has begun. Patient perspires easily, very susceptible to the least draught of air, chills easily. Ear and mastoid extremely tender to slightest touch. When used early before suppuration has started the higher potencies are most useful.

CHAMOMILLA. The patient is restless and irritable, and all the symptoms are aggravated by the application of heat in any form. Cold applications give more relief than heat in any form. In children the child wishes to be carried all the time. Noises, especially music, aggravate the pain.

NATRUM CARB. Sharp piercing pains in ear and mastoid and a plugging sensation in the ear, with a great tendency for the patient to perspire about the head and neck.

ARUM MET. The mental symptoms predominate. Patient is depressed in spirits, very melancholy. More soreness than acute neuralgic pains in the mastoid and noises of all kinds aggravate the symptoms.

In the second or exudative stage the variety of drugs differ from the congestive type, and such remedies as Hepar sulph., Kali sulph., Pulsatilla, Kali phos., Capsicum, Silicea, Kali bich., Aurum met., and Mercurius viv., are more useful.

In the treatment of acute mastoiditis during the secondary or exudative stage it is no longer one of purely medicinal action, but one for the surgeon and the internist. After the formation of serum or pus has taken place in the mastoid cells, drainage becomes one of the most important factors, and this must be thoroughly established before the selection of any remedy should be considered. When drainage, either from spontaneous or artificial opening of the membrana tympani is established, the selection of drugs to promote resolution of the infected areas is the next most important step in the treatment of these cases. The properly selected remedy according to the totality of the symptoms presented by the patient, when administered, will in many of these cases cause a rapid resolution of the disease without

NON-OPERATIVE TREATMENT OF ACUTE MASTOIDITIS.

more radical operation. The character of the infection, however, must be taken into consideration as well as the severity of the symptoms present, before a decision as to whether mastoid operation or non-operative measures offer the best chances with least danger to the hearing apparatus.

HEPAR SULPH. Probably one of the most frequently indicated remedies during this stage. Profuse discharge of thick creamy pus, is useful before and after operation. Patient perspires easily, extremely sensitive to air or least draughts, chills easily, sensitive to touch over inflamed area with sharp shooting pain in ear and mastoid.

KALI SULPH. Patient's symptoms would indicate pulsatilla as the remedy, but differs in the color of the discharge. When kali sulph. is indicated the discharges are always a bright orange yellow.

PULSATILLA. Profuse greenish or greenish yellow discharge. Pain and soreness over the mastoid worse from heat and better from cold applications. Pain shooting and neuralgic in character. Patient's nervous temperament changes rapidly. Cough, when present, loose during day and dry at night.

KALI PHOS. Discharge is very fetid and dark in color.

CAPSICUM. Also useful during the stage of suppuration when the mastoid is red, swollen and extremely sensitive to touch, a symptom which usually indicates operation, especially when the infection is virulent. Sharp neuralgic pains over the whole mastoid but most sensitive over the tip.

SILICEA. More frequently indicated after operation, especially when necrotic bone has been found.

KALI BICH. Thick, ropy, stringy discharge, which is hard to remove because of the gluey character; discharge is fetid. Sharp pain in mastoid and glands of the neck. Patient nauseated, prostrated, with weak flabby and, at times, intermittent pulse.

AURUM MET. Deep soreness over whole mastoid with sharp pains which are aggravated by all noises. Patient mentally depressed. Useful after operation where caries of mastoid was found.

MERCURIUS VIV. Purulent, thin, greenish and offensive discharge, or it may be bloody and fetid. Pains always worse at night.

In this short paper it is impossible to mention all the remedies that are useful in the treatment of acute mastoiditis. The vaccine treatment is sometimes used, but will be discussed in another paper. The

selection of a remedy does not depend upon the diagnosis of a disease, but upon the totality of the symptoms presented by the patient, therefore the patient is prescribed for and not the disease.

The mental and general characteristics when closely studied will aid in the selection of the proper drug, and the potency must be determined by the physician's own individual experience.

POST-OPERATIVE CARE OF ACUTE MASTOID CASES.

OPERATED mastoid cases require the most careful attention of an experienced aurist and this, whether it be a simple mastoid exenteration for acute osteitis, or a radical operation for the relief of a chronic suppurative otitis media. These cases should not be trusted to an inexperienced interne or to a trained nurse, as failures are too frequently the result of meddlesome treatment. It is important in many instances, not to do many of the things which the ambitious inexperienced are wont to do in their eagerness to "make a wound heal." Again, the very serious complications which may follow mastoid operations furnish reason enough for the demand of the services of a most alert and experienced clinician.

The lengthy convalescence and wound healing of simple mastoid operations have always given a stimulus to operators to endeavor to find some method of treating these wounds which would insure a shorter period of healing. Under the older method of leaving the post-auricular wound open to heal by granulation, the time for healing averages from six to eight weeks or longer. This entails many painful dressings, the wound being repacked at each dressing. It means that during this time the patient, already worn out and exhausted by the strain of the otitis media, the mastoiditis and the nervous shock of an operation, is compelled to carry about with him a conspicuous dressing which subjects him to the stare of a curious public.

The open wound method, however, seems best suited to certain cases, namely, where the soft structures have become intensely involved and are in a phlegmonous condition. In fact, suturing such cases, when a large sub-periosteal abscess has been present, almost always means suppuration and stitch abscess. Again, where there has been a large dural or sinus exposure with granulations or discolora-

tion, and when the clinical symptoms do not guarantee further exploration, it may be advisable to leave the wound open in order to make direct inspection of the post-operative changes in these structures. If the open wound method is employed it is our custom to pack the cavity lightly with either sterile gauze or a five per cent. iodoform packing. In young children we refrain from using iodoform for the reason that juveniles tolerate this poorly. We have observed that it frequently occasions most violent symptoms within a few hours after the packing of the wound. In a case recently operated, a child of seven years, we used iodoform gauze in the wound. Six hours after the operation the patient became delirious, presented projectile vomiting, but the pulse and temperature remained normal. The mere substitution of plain gauze in the place of the iodoform caused an immediate subsidence of the symptoms. Furthermore, iodoform, in these patients of tender years, tends to develop a dermatitis about the wound edges and a maceration of the skin of the posterior aspect of the auricle. This maceration of the epidermis is a rather frequent occurrence not only in children but also in adult patients, and this whether plain or iodoform dressing is used, so that it is our practice to place a liberal coating of sterile vaseline around the edges of the wound before applying the primary dressing. This protects the skin from the irritating discharges. The primary packing is permitted to remain undisturbed for from five to seven days, depending upon the temperature. The outer gauze dressing is changed every second or third day, depending upon the amount of secretion from the wound. After removal of the primary packing the wound is inspected carefully every two or three days to note the development of granulations. At each dressing, the wound is searched diligently for shreds of gauze, for these, if overlooked, become a source of much anxiety since they may be hidden by granulations and perpetuate secretion, even causing sinus formation.

We do not practice irrigation of these wounds unless there is a purulent secretion, and here again is evident the necessity of having an experienced observer, for too frequently the normal secretions from a healthy granulating wound are interpreted by the inexperienced as pus and the wound is subjected to irrigation with antiseptic solution. No more disastrous procedure could be followed in interference with nature's endeavor to fill the cavity.

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If pus is observed within the mastoid wound, we make a most careful search with probe to ascertain if a suppurating cell has been overlooked, if so, it is freely opened. A thoroughly operated mastoid should not present pus except from subsequent suppuration from the flaps or an extension to the inner plate. If this suppuration is present at the time of, or subsequent to the operation, we have found bromine solution to be the most efficacious antiseptic in clearing up the condition, but the use of this is discontinued just as soon as the pus disappears.

Care must be exercised in preventing the superficial granulations from bridging over and forming pockets. Mastoid wounds show a great tendency to do this, and it must be the care-taker's endeavor to hold these in check and encourage the growth from the depths of the wound. When the granulations show a tendency to become spongy and exuberant, they should be trimmed down to the surface, and after the bleeding is controlled the area should be dusted with boric acid powder. We prefer this to the silver nitrate because it does not occasion the excessive secretion.

When a wound fails to granulate or the granulations are stationary, we should look first to the local condition for a reason. A suppurating cell, newly involved bone, or the presence of a foreign substance may occasion a cessation of the healing process. A culture of the wound may throw light upon the reason for this lack of healing. For this reason it is our custom, where we find it necessary to use the open wound method in mastoid cases, to make cultures from the mastoid cavity at frequent intervals. Upon the finding of the original infecting bacteria, or some new infection the application of an autogenous vaccine has given us pleasing results. The brief citation of two recently operated cases will illustrate.

CASE 1. Acute suppurative mastoiditis, pneumococcic. Wound did well for three weeks then ceased to granulate. The granulations became spongy. Culture from the wound developed pneumococci. An autogenous vaccine was administered, and after the second inoculation the wound began to heal without local stimulation.

CASE 2. Acute suppurative mastoiditis, streptococcic. Refused to heal after six weeks. Culture of wound revealed the presence of streptococci. An autogenous vaccine was administered with the same pleasing result as was obtained in the first case.

The wound may refuse to heal as a part of a general lack of recuperative powers. A patient may harbor a focus of infection somewhere within the body which focus was primarily responsible for invasion of the mastoid, and which focus, more or less active, constantly reduces the patient's reactivity and recuperative powers. We deem it of great importance, therefore, to carefully scrutinize the structures or cavities which are the more common foci, and these are the teeth, the tonsils, post-nasal adenoids, and nasal accessory cavities. The finding of a local diseased condition in any of these structures necessarily calls for simple drainage, at least, until such time as thorough eradication is possible.

A sluggishly healing mastoid wound calls for a most careful examination of the patient's general condition. The blood and urine should be carefully scrutinized and inquiry made concerning the diet, rest and exercise. The administration of such remedies as arsenicum, calcareas, china, either alone or in combination with arsenic, mercurius or the iodides of mercury will, homœopathically, render much assistance.

In another class of cases a mastoid wound lapses into a sluggish state and we are unable to find a local focus, or a general condition to account for the lack of healing. We attribute this to a local lack of recuperative power. In these cases we have found sub-nitrate of bismuth paste or scarlet R. to be of value in encouraging granulation. The effect of light and air upon these wounds is not to be forgotten. Light may be applied in the form of rays from a non-focusing leucodescent lamp or the sun-rays. In many cases we have removed the dressings and permitted the patients to go about with a small piece of cotton over the granulating surface. It is surprising in some cases how rapidly the wound heals under this treatment.

A very important observation to be made at each dressing is the condition of the external auditory canal. If there is secretion present, it should be mopped away with cotton tampons, and a wick drain introduced exerting pressure where the canal has been separated by retraction of the flaps at the time of the operation. Failure to do this may result in a permanently narrowed canal. Secretion from the middle ear permitted to lie in the external canal causes a maceration of the epithelial lining with the production of an external otitis.

Some operators prefer to suture the post-auricular wound except

for a very small area in the lower angle through which a drain is introduced. This method followed by primary union shortens the time of wound-healing by several weeks. The sutures and drain are removed on the fifth or sixth day, and a fresh drain introduced and changed every other day until the cavity is filled with granulations. We have practiced this method in a great many cases and have found it to be quite satisfactory.

The use of the so-called blood-clot treatment of mastoid wounds was proposed by Sprague and put into practice by Blake. The objects of this dressing are to obtain healing by first intention and retention of the normal contour of the mastoid, the wound healing in from four to seven days with practically no after-treatment.

Blake claims, (1) the blood-clot is not an inert filling material but has in its serum a protective defense viable for at least forty-eight hours after the formation of the clot, and its clot a repair material capable of effecting closure of the antral and surgically produced cortical openings and of traversing the unified mastoid space; (2) the use of the blood-clot completely filling a carefully exenterated mastoid cavity results, when it persists in healing by first intention in a varying percentage of cases; (3) the persistence of the blood-clot during the period of its protective viability only, even though it then break down and come away entirely, results in the formation of foundation granulomata which are a base for subsequent repair with speedier and more satisfactory results in healing than are obtainable when the wound is dry packed from the beginning; (4) the only cases to which the blood-clot dressing is inapplicable are those in which, on account of pyogenic invasion of surrounding structures, it is desirable to keep the mastoid cavity open as a path of access, and those in which a systemic condition of the patient, or the extent of the local infection, does not warrant the expectation of speedy repair.

This method of dealing with acute mastoid cases at first sight comes as a shock to the surgical mind, for most certainly it is contrary to all previously expressed views. However, men who have been brave enough to disregard surgical precedent in favor of this theory concerning the healing properties of the blood-clot have reported surprisingly satisfactory results. Wheelock (in the *Laryngoscope*, February, 1916) describes his experience with this method in most enthusiastic terms. Reik, of Baltimore, in his article, "The

POST-OPERATIVE CARE OF MASTOID CASES.

Ideal Mastoid Operation" (*Laryngoscope*, February, 1916), describes this method of dealing with the wound, and further states that he obtains primary healing in seventy-five per cent. of cases of acute mastoiditis in connection with acute suppurative otitis media. In chronic suppurative cases he obtains fifty per cent. primary healings under this method.

Our experience with this treatment is entirely too limited to express an opinion, but results thus far gained will serve to encourage a most thorough trial.

Post-operative pain is seldom severe enough to call for an anodyne, and we refrain from administering morphia except in very exceptional cases. At this point an efficient nurse will do much to encourage the patient, and the assurance thus gained will serve to quiet the patient's anxiety and nervousness, which are usually present to magnify the wound soreness. The application of good surgical technique will also minimize post-operative pain. Soreness and stiffness of the neck are present when the muscular attachments at the tip of the mastoid have been severed. This usually disappears in three or four days, whether local therapeutic measures are employed or not.

It is not uncommon to observe the post-operative temperature in operated mastoid cases ranging between 99° and 100° F. for twenty-four to forty-eight hours following the operation, and when studied in connection with blood counts it may be interpreted very definitely. A study of the blood will give us a prognostic information before the temperature curve. A moderate leucocytosis with a normal polynuclear percentage showing a tendency to recession in twenty-four or forty-eight hours insures rather calm sailing. If the temperature is normal or subnormal and the leucocyte count high we should be on the lookout for trouble. Hence the advisability of frequent blood counts in these cases as well as the frequent temperature observations. We make it a rule never to discharge a patient from the hospital until he presents not only a normal temperature but also a normal leucocyte and differential blood count.

In certain types of cases, there may be a post-operative temperature of a septic type extending over a period of several days and not terminating in any of the otitic intracranial complications. We have observed this especially in those cases in which the invading organism was the streptococcus. It has been our observation that

cases operated after the middle ear or mastoid condition has existed for some time and who present a normal or slightly elevated temperature at the time of the operation will, even in the presence of free pus in the mastoid, seldom exhibit a post-operative temperature. However, in cases which are operated in the acute stage, when the otitis media is still quite active and the temperature is high, we usually observe post-operative temperature more or less in keeping with the pre-operative temperature. The occurrence of infection of the wound will occasion a post-operative temperature.

If the post-operative temperature does not exceed 100° F., we do not consider it as calling for any special treatment; however, in temperature due to the bacterial invasion it is our custom to administer an autogenous vaccine. As adjuncts to this the bowels are thoroughly evacuated and the urine examined. Proctoclysis has given us most gratifying results in controlling a septic temperature, and we persist in its application until the temperature has returned to normal and remained so for several days. We give these cases just as much food as they can properly take care of, consisting of nutritious easily assimilable articles. *Apis mellifica*, *arsenicum*, *chininum arsenicosum* and *gelsemium* are the remedies which seem to us to be the ones most frequently indicated.

Intracranial complications are usually signalized by a temperature curve more or less characteristic but not to be wholly relied upon. Meningeal invasion is usually attended by high temperature which shows little tendency to remit. Sinus infection causes a rise in the temperature, but the characteristic rise and fall associated with chill and sweat are not observed until the septic focus in the sinus begins to infect the blood-stream. Brain abscess does not present subnormal temperature until pressure symptoms develop. More frequently there is a high temperature with a slow pulse. We must depend upon the symptom complex in its entirety, and the temperature is but one symptom which clinically we have found unreliable.

Temperature may occur in operated mastoid cases as a result of infective processes removed from the mastoid—a lighting up of a focus elsewhere. We have most frequently observed this to be in the tonsils, either in the form of an acute tonsillitis or a peritonsillar inflammation. Treatment of these conditions is too well understood to go into the details of same at this time.

POST-OPERATIVE CARE OF MASTOID CASES.

In some operated cases we encounter symptoms which are difficult to interpret satisfactorily at a glance. A case of double mastoiditis in a lad of seventeen years presented marked photophobia causing a blepharospasm confined only to the right eye. At the time of the operation there was found a large exposure of the lateral sinus on this side, but the walls of the sinus appeared perfectly healthy; and while the post-operative temperature and blood-count were normal, there was danger lest the ocular manifestation was the precursor of a lateral sinus involvement. We have observed this as an apparently premonitory symptom of septic sinus thrombosis. Examination of the eye revealed nothing abnormal. After the symptom had persisted for four days we concluded that it was a hysterical manifestation. This was satisfactorily demonstrated by observing the patient from behind a screen in the absence of the nurse when the symptom entirely disappeared, but reappeared as soon as the nurse returned. Finally by suggesting daily improvement in the symptom it entirely cleared up.

In two cases of simple acute mastoiditis there occurred following operation a most violent fifth nerve neuralgia, in one case associated with paresis of the external rectus of the side of the operation. The operation in these cases was unattended by accident, the wounds healing promptly and with complete cessation of discharge from the ear and return of hearing. This symptom complex is known as Gradenigo's syndrome. There are a number of theories as to its etiology, one that it is the result of a circumscribed lepto-meningitis at the tip of the petrous pyramid, another that it is reflex, others that it is toxic. The neuralgia in these cases continued with increasing intervals and diminished severity for a year and a half in one case, the other patient still having occasional attacks.

ABSTRACTS.

Un cas de Keratite bulleuse par bombes asphyxiantes.—par le Dr. Campos. (*Annales d'Oculistique*, Dec., 1915.)

A unique case, aside from the fact that primary bullous keratitis is exceptional—de Wecker reports one case, which Sichel had diagnosed corneal bulla.

A. S., an infantryman, was wounded May 13, 1915: his diagnosis card read: Burn of second degree (asphyxiating bomb). A shot-wound in the soft parts of left forearm. His case record: Second degree burn of thigh and foot by asphyxiating bombs. Projectile wound "en seton" of left elbow. Urinalysis: Albumin 40 mg. in 24 hours, *i. e.*, 50 mg. per litre.

When I first saw him, May 17th, he complained he could not see. Each cornea much dulled, the peripheral parts more or less transparent, the right one worse. Right pupil the smaller, but both dilate well with atropin. A corneal bulla in the middle of the left cornea: this bulla consists of three little pockets which, by displacing the upper lid, one can readily make fuse into one at the most dependent part.

How was this bulla brought about? The intraocular tension was manifestly low. The patient asserts that he has had no pain in the eyes. The conception of this as a blister is met by the fact that there has been no desquamation of corneal epithelium.

Corneal epithelium readily reattaches to the cornea. Histologically, in bullous keratitis this reapposition is usually prevented by an underlying layer of newly-formed conjunctival tissue. Evidently there would be no such new formation in such a rapid case as this with a healthy cornea.

A simple pomade of hydrated lanolin to each eye sufficed without bandage or atropin, since there was no abrasion nor iritis.

May 28th. Complete cure. The patient had considered himself well a week earlier.

NOTE.—The asphyxiating gas is chlorine: This patient did not experience the usual (?) symptom of intense burning (*cuisson*) in the eyes—he had no suffering in the eyes at any time—but his respiratory

ABSTRACTS.

tract was intensely irritated. The impairment of vision was immediate and augmented with the gaseous diffusion; it did not improve until after the treatment was instituted.

J. L. M.

La conjunctivite provoquée par instillation d'ipéca. Medecin-Major Bailliart (*Ann. d'Ocul.*, Dec., 1915.)

Conjunctivitis from instillation of ipecac powder is very frequent in the army and very general, its use having been introduced by the colonial troops. It is monolateral, since application to one eye (usually the right) suffices to produce the desired result: evacuation. The material for the delinquency is almost always carried as a small packet in purse or pocket, where it will be always at hand. When discovered the "simulator" usually confesses his fault.

Conjunctival secretion is absent: marked dryness, no agglutination nor crusts even when chronic. Externally the lids are often eczematous, sometimes oozing markedly and involving both lids even to the brow, but more generally there is a simple erythema along the cutaneous edge of the lids. On opening the lids the color of the bulbar conjunctiva strikes one at once—it is a *washed* pale dirty red. This washed appearance is most marked near the lower cul-de-sac, which is thickened and dirty red but not vascular—looking like washed muscle. Chronic cases may show a grayish tint of thickened mucosa, particularly along the border of the lid.

In all cases the conjunctiva of the upper lid remains absolutely normal; this contrast is diagnostic. The discoloration may persist several weeks after the ipecac is stopped. There are no complications—no corneal lesion after even two and a half months of the practice.

This ipecac conjunctivitis is unknown to many, if not most, of the profession: "we have known it only since February." The (avowed) cases came diagnosed "obstinate conjunctivitis," "traumatic conjunctivitis from particles of earth," "chronic conjunctivitis," or even "secondary accident."

With such easy diagnosis the practice should soon be abolished.

J. L. M.

Some reflex manifestations of intranasal origin; suggested nerve-paths through which they may travel and operation for their relief.

A valuable paper (*Jour. of O. & O. L.*, Nov.) by B. F. Andrews, of Chicago.

In a patient with eye strain or spasm of accommodation who rejects in turn the glasses prescribed for the ever-changing error the nose should be thoroughly examined under anesthetic and astringent. The writer explains these cases: A more or less constant pressure impulse between septum and turbinate travels through the sphenopalatine ganglion to the ciliary ganglion where it is transferred by basket cell connection to motor filaments from the motor oculi which supply the orbicular and ciliary muscles. Possibly muscular astigmatism may thus be accounted for: certain sectors of the ciliary muscle from greater stimulation contracting more firmly than others, causing thus unequal tension on the lens and hence unequal curvature.

A case of apparent Eustachian deafness (< right) was improved after submucous resection of a septal ridge which was pressing firmly the length of the right inferior turbinate. Sensory filaments from the inferior turbinate and septum entering the sphenopalatine ganglion pass directly to the otic, where they communicate by basket cell arrangement with motor cells which act on the m.t. through the branch to the tensor tympani muscle. Certain impulses might take the longer route of the gasserian ganglion.

"The tensor tympani muscle may be called the muscle of [auditory] attention, as the ciliary is the muscle of accommodation. There certainly must be a species of nervous deafness not due to auditory nerve lesion where, through over-stimulation, the drum becomes unduly tensed, retracted, and hence less movable."

Similarly, through the vagus intranasal stimuli may cause sneezing, coughing and asthma.

As to operations, each case presents its own problems. If the septum is at fault it should be corrected, preferably by the submucous resection method. If the turbinates are deflected laterally or septally, they should be sprung in the opposite direction with little force and broken along their bony attachments, and kept in new position by cotton pledgets placed on each side. If the turbinates be too thick, they may be thinned by grasping them between the blades of suitable forceps and crushing them, producing enough traumatism to bone and mucous membrane so that when healing takes place, firm cicatricial contraction will bind mucous membrane to bone and thus pre-

vent over-swelling and pressure on surrounding parts. When the middle turbinate contains a large pneumatic cell, Andrews splits the turbinate through the cell from top to bottom, removes the lateral segment and, if necessary, fractures the remaining portion along its bony attachment and moulds it over until it occupies a position midway between septum and lateral wall, free from either.

If the reflex theory here presented is substantiated by relief of suffering and inconvenience to the patient in the removal of the cause at its source, resort to the more difficult and often dangerous operations of ganglion injection or ganglion destruction, when directed toward the relief of these manifestations, are hardly justifiable. Resection of nerve trunks, unless clearly proven to be diseased, should be superseded by other means more in line with preservation of nerve function.

In closing he emphasizes:

1. The importance of these reflexes both to patient and physician.
2. The necessity for accurate diagnosis of intranasal conditions.
3. Conservatism in operating directed toward preservation of the healthy mucosa and, therefore, function—accuracy rather than extensiveness.
4. The necessity of a more extended and careful study of the intranasal areas responsible for eye and ear reflexes.

J. L. M.

Teeth-Grinding and Adenoids.—Both in the East Indies and Utrecht Dr. Benjamins has noted the frequency with which the presence of adenoid vegetations in children is associated with the habit of grinding the teeth during sleep at night. In each locality he has dealt with 250 cases of adenoids, and he gives the following figures, based on the 500 cases, representing the percentages of the patients exhibiting the following signs of adenoids:—

Snoring	60 per cent.	Aprosexia	33 per cent.
Catarrh	46 “	Enuresis	32 “
Deafness	41 “	Enlarged tonsils	25 “
Teeth-grinding	34 “		

Out of 325 of the cases 47 per cent. were mouth-breathers and 43 per cent. spoke with nasal voices. Among all his patients Dr. Benjamins counted 20 instances of epistaxis, 11 of bronchial asthma, and 8

of stammering. Operations for the removal of adenoids were performed on 55 patients with teeth-grinding, and 42 were cured of the habit, 8 improved, and only 5 continued to grind their teeth as before. The habit may be acquired, as he points out, very early in life. Two of his teeth-grinding patients were aged ten and twelve months respectively, each having four teeth in each jaw: the oldest patient was twenty-one years of age. The larger the adenoid growths in any case the greater is the probability that the patient will grind his teeth: the enlargement of the tonsils, contrariwise, seems to be of little influence here, as it occurred in only 42 out of 172 teeth-grinding patients. The ages of Dr. Benjamins' patients were as follows: 11 were under three years of age, 106 were aged three to five years, 219 were six to ten, 130 were eleven to fifteen, 26 were sixteen to twenty, and 9 were twenty-one years or more. He believed that patients with adenoid vegetations exhibit an increased *reflex irritability*, and that it is this, rather than anything in the nature of CO₂ poisoning, that makes them liable to nocturnal enuresis, teeth-grinding, and the like. In the case of teeth-grinding he assumes that the receptive field, or point of departure, of the reflex lies in the mucous membrane of the nasopharynx. The *afferent* path is through the glossopharyngeal nerve or the pharyngeal branches of the sphenopalatine ganglion. Neurons in the midbrain presumably act as connecting links to set in action the motor nerve cells of the trigeminal nerve, particularly those supplying the pterygoid muscles.—*Hom. World*, Nov.

Chicago Ophthalmological Society, Oct. 18, 1915 (*Jour. of O. and O. L.*, Nov.).

A. N. Murray reported a case of **golf ball accident with glass implantation**. A year ago eyeglasses were smashed, lids and cornea cut, prolapsed iris "and an opening into the sclera" 3 or 4 mm. long about 3 mm. from the nasal limbus. Iris abscised. "A week later a piece of glass 2 mm. by about 1 mm. was found embedded in the cornea just below the center and flush with the surface, having been present all this time without having produced any symptoms whatever." During removal it fell into the anterior chamber, was lifted on the point of a keratome and extracted with iris forceps. Its position was determined by oblique illumination and contact with the keratome. The cataract absorbed in five or six months; capsule sev-

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ered from cornea; posterior capsule needled. V. 20/24 with a + 10 sphere. "The patient is now wearing this sphere before the other eye and apparently obtains binocular vision, except when there is convergent strabismus of the injured eye which developed soon after the accident. At first marked diplopia was present, but now only the left eye converges."

"A very fine splinter of glass, visible only with the loupe and oblique illumination is still embedded in the corneal tissue at the nasal limbus, with exudate behind it, but the condition apparently causes no irritation." There is no astigmatism although the corneal scar is very irregular and there was quite extensive scarring about the cornea. There is no involvement of the ciliary body.

DISCUSSION.

W. H. Peck thinks X-ray examination advisable when there is suspicion of glass being embedded. Glass is opaque to the Roentgen ray according to its composition, size and distance.

Dr. George F. Suker asked if attempt had been made to determine whether there is superimposition of the two images. (Dr. Murray—None.) May it be that the patient suppresses one image?

Dr. Murray had simply assumed that the patient had binocular vision; the patient does not notice that he sees double when fatigued.

H. S. Gradle: It does not seem possible that this patient could have true binocular vision, with a dioptric difference of at least 12 diopters in the two eyes and owing to the subsequent difference in the size of the retinal images, but stereoscopic vision might be present, and the optical axes might be parallel.

Dr. Murray, in answering questions regarding binocular vision, said he had not made all the tests possible to determine this matter; that the patient did not have any difference in the size of the retinal images; that these various tests with reference to binocular vision will, however, be made by him. With the exception of this one sliver of glass, there does not seem to be any glass in the eye now. There has been no photophobia nor irritation during the entire year. No effort has been as yet made to determine whether the patient has accurate depth perception.

Willis O. Nance, five years ago, had reported to this society a case of injury to the eye by a broken spectacle lens. The literature

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at that time showed only two or three such cases; they have been, however, reported somewhat more frequently since then. Injuries to children from broken glass lenses seem to be exceedingly rare, considering the number of spectacles worn. The speaker inquired what experience the members have had in locating glass by means of the X-ray. He understood that the diamond throws no X-ray shadow [?], where ordinary glass does.

President Tivnen: Potter and others say that whether glass in the eye can be seen by the use of the X-ray depends upon the composition of the glass. Sometimes it becomes a medico-legal question of importance, whether an X-ray examination should have been made. In any event, it is a good safeguard. Generally speaking, the localization of glass in the eye by the X-ray is very disappointing.

Michael Goldenburg reported the case of a piece of steel or iron having entered the eye some ten years previously. He first saw the case about six years ago, when he noted the piece of metal lying flat upon the anterior surface of the iris. The metal could be plainly distinguished from the surrounding tissue by its stationary position and the contraction and dilation of the iris around it. He saw the case again two months ago and there was absolutely no sign of the metal ever having been present. Whether it had become covered by the iris pigment or what the manner of its disappearance was, was unknown.

Dr. Suker strongly deprecated any attempt to remove this small remaining splinter of glass, because this glass is undoubtedly lead free, nonirritating and will not corrode. Also because the glass has become so well encapsulated and is immobile and the place of its location also precludes mobility and traction upon it, and finally there is no evidence of irritation. The exudate is probably thoroughly organized by now. Unless symptoms of irritation should appear, interference should not be undertaken.

M. H. Worthington had had a case of injury to the anterior surface of the cornea by the lens of the eye-glasses being broken by a tennis ball. The speaker also referred to the case of a young man who had received cuts on his cornea from broken glass caused by a missile being thrown through the window of a street car on which he was riding. The former case he had reported. He believed these cases to be extremely rare.

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Dr. Murray told of a man taking large doses of **digitalis** who developed **purple vision** when, and only when, taking that drug.

The Nose and the Eye.—Dr. Tydings presented a case, a young man 20 years old, whose father had died at the age of 48 of kidney trouble. The mother living and in good health. Two brothers and one sister are living. There is no disease history. On the twenty-eighth of July this patient came to the speaker's clinic blind in the left eye. There was light perception but no vision.

Examination showed neuroretinitis, choroiditis, two patches, and what seemed to be a sarcomatous growth in the superior temporal quadrant of the left eye. Enucleation was advised. The speaker said he would have recommended enucleation if the growth had stood alone. There is considerable doubt as to the etiology. The urinary findings were negative; there was no appearance of inherited lues; the Wassermann test was negative. There is only a feeble response to the tuberculin test.

The nasal septum was deflected to the left. The left sphenoid was not healthy; the walls were denuded and the bone exposed. The septum was straightened and an opening made up to the sphenoidal sinus; the patient was put on active specific medication and tuberculin injections. There has been good progress; there is now 20/160 vision in this eye, and the other is perfectly normal. The speaker believed this condition to be of tubercular origin, although he was not sure.

W. A. Fisher saw this same patient about a month ago. The condition tonight looks much like many cases of choroiditis we see. There is a pigmented choroidal spot just below the fovea centralis; above the fovea and a little toward the temporal side there is an atrophic spot in the choroid. There is no swelling of the spot, but when seen with Dr. Tydings August 2, 1915, this white spot was ten times larger than it is tonight and elevated from the normal part of the fundus about four diopters. It presented at that time a picture of a sarcoma of the choroid. There was no vision at that time and the speaker believed it to be a sarcoma. The contrast between August 2, 1915, and tonight makes the case one of very great interest.

Dr. Gradle said that in this case at one time there was probably some interference with the circulation of this area with subretinal or subchoroidal hemorrhages and a collection of serum. An autolytic process

retinal hemorrhages and a collection of serum. An autolytic process involving the retina and the choroid probably followed. Now the condition is one of atrophic retina with the sclera showing through. There is still some swelling of the surrounding area. We cannot tell whether the central area is swollen, but elsewhere there is edema. The condition now is what might be designated as a hole in the retina and choroid due to autolysis from the subretinal collection of serum.

Dr. Goldenburg said that in view of so much destruction of the retina and choroid and so little pigment epithelium or choroidal pigment being present, one would be led to think of what von Michel said: That where there is great destruction of tissue with little or no pigmentation and a few changes in the vessel walls, the condition can be safely diagnosed as tubercular. In view of the fact that Dr. Tydings' injection of tuberculin was followed by a rise of one and a half degrees, this would seem to be good ground for regarding the condition as tubercular.

Dr. Tydings: The patient began to complain on the twenty-fourth of July, and was seen four days afterwards. The sudden blindness was ascribed by the speaker to the swollen disc.

A Double West Operation.—John A. Pratt, of Aurora: Last July, I demonstrated the West operation on the patient for a number of physicians. The patient's brother, a physician, operated the other side the following day. The patient received four or five treatments and then was allowed to return to his farm about one hundred and fifty miles distant. The results were so good that three weeks ago the patient was sent to W. A. Fisher, of Chicago, for a cataract operation. Dr. Fisher found on microscopical examination that pus was present, and sent him to me to have him cleaned up. After three weeks' treatment the eyes seem clean and the tears are carried off, but upon microscopical examination pus is still present. The question is whether to send the patient back to have the sac trouble cleaned up, if possible, or destroy the sac and perform the operation for cataract. The patient has only one eye and is thirty-five years old.

Dr. Pratt, in answer to a question, said that there was no pus to be seen by the eye, there is practically no discharge, and the tears drain into the nose.

Dr. Fisher: This patient has only one eye, has 20/120 vision

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and a cataractous lens and has been referred to the speaker for an intracapsular cataract operation. He had an intranasal operation to drain the tear sac and there was pus in the conjunctival sac one month ago when he came for the cataract operation. He has since received daily treatment and today pus is found in the conjunctival sac. The nasal operation as performed would be considered a success providing the lens was not opaque, but the question of infection in the only eye he has is a very important one.

The case should have more treatment; the operation should not be censured, because a tear sac operation is not always successful.

President Tivnen inquired what would be the objection to tying off the canaliculus.

Dr. Pratt saw no objection to it, although it is slit clear up now. The sac may, however, be injected with trichloroacetic acid.

President Tivnen felt the removal of the sac would be justified.

Dr. Tydings had had a similar case, where the pus sac did not clear up for three or four months. The pneumococcus and the streptococcus predominated. The sac was extirpated.

Dr. Goldenburg saw several of these cases in Berlin which were performed by the originators of the operation and were considered beautiful results. They were just as good as in this case; but the most serious phase of a dacryocystitis is the pus that is retained, the virulence of that pus and the danger to the eye of a serpiginous ulcer or an acute phlegmon. As long as there is any pus there at all, there is always that danger present. The control of the epiphora is not a serious matter at any time, but the serious matter is the control of the pus. The speaker would strongly suggest that the sac be removed according to the method of Dr. Mueller, of Vienna.

J. L. M.

Somnoform or Bruggs' mixture (which is the same thing under another trade-name) is the most efficient, the safest, most rapid and most agreeable general anesthetic for such minor operations as incision of one or both ear-drums, curettement of granulations in the tympanic cavity, opening of abscesses or furuncles of external auditory canal (or any other part), incising of peritonsillar abscess when general anesthesia is desired—as perhaps the patient himself thinks it always is, replacing of recent nasal fractures, opening into the maxil-

lary sinus in the Mickulicz operation after the section of the inferior turbinate has been removed under cocain, breaking down of adhesions in the nasopharynx in the adult and many other less frequent short operations. In operations to be prolonged more than two minutes, ether preceded by somnoform, is the routine.

Somnoform is the ideal anesthetic in both children and adults for short operations: it produces profound anesthesia in from 30 to 90 seconds and allows a period of from one and one-half to three minutes for operating. The recovery to consciousness occurs usually within three to five minutes after discontinuance of the anesthetic.

It is as safe as nitrous oxide anesthesia, is as rapid in its action, recovery being equally rapid, does not produce cyanosis, has no serious after-effects, and because of the simplicity of the apparatus and ease of transportation, is preferable to nitrous oxide for operations of short duration.

The mortality is lower than that of any other general anesthetic in use, unless it may possibly be nitrous oxide gas.

As a preliminary to ether, somnoform has a very great field of usefulness, eliminating largely the disagreeable struggle and excitation of the first stage of ether, shortening the time by from three to ten minutes, and lessening the quantity of ether used.

A competent anesthetist is as desirable in the administration of somnoform as in the employment of any other anesthetic.—Halstead (Aug. *Laryngoscope*. Abst. in Nov. *J. O. and O. L.*)

J. L. M.

Infectious Arthritis of the Feet from Infection of Tonsils.—Mr. M. S., aged 28, bookkeeper, with no venereal history, does not drink spirituous liquors; smokes one dozen cigarettes daily. About six weeks previously, patient had an attack of acute tonsillitis; about two weeks following, the feet were painful and swollen; a few days later, the swelling subsided but the pain continued and grew worse. Owing to the pain and difficulty in walking, he was referred to the N. Y. Hospital for Deformities and Joint Diseases by his family physician. Examination revealed the tonsils inflamed and enlarged, and the patient was referred to Dr. Julius Auerbach, the throat specialist of the institution, who coincide in the opinion that the throat was undoubtedly one of the sources of infection. The patient was then referred

back to his family physician with our opinion and the advice that the tonsils be removed. This was done at the hospital by Dr. Auerbach, March 4, 1915. For the next two days, there was increased pain and tenderness in the feet which gradually subsided, and for the past three months the patient has remained well and is free from all pain. The microscopic examination of the tonsil shows streptococci.—Frauenthal, *J. A. M. A.*, Nov. 27, 1915.

J. L. M.

Salvarsan and Neosalvarsan.—Dunbar Roy, in his "Progress of Ophthalmology During 1915" (*J. of O. & O.-L.*, March) objects to the use of these drugs because he still believes that there is a possibility of a poisonous effect, which may be nervous deafness, following the injection.

J. L. M.

Nystagmus.—L. D. Prose (*J. of O. & O.-L.*, March) quotes Mackenzie as one of the authorities—particularly in regard to the galvanic reaction of the healthy ear. Jansen, he says, considers much nystagmus upon looking both ways to be a sign of sequestra formation or progressive infection of the labyrinth.

The cause of nystagmus is an imperfect or disturbed cortical innervation of the voluntary eye muscles.

Before operating a case of infantile, or congenital, nystagmus, when we know that there is a permanent amblyopia, one should make it a rule to inform the family or the patient that vision will remain below normal, notwithstanding successful operation.

Symptomatic nystagmus has been connected with abscess, degenerations, hæmorrhages, tumors, embolism in the corpora quadrigemina, corpus striatum, cerebellum, restiform bodies and medulla, with multiple sclerosis, syphilis, tuberculosis and toxæmias from chloroform, ergot, quinine, arsenic, lead, alcohol and nicotine, with neuritis and meningitis.

Aural (more properly labyrinthine) nystagmus affords the most valuable aid in diagnosing labyrinthine disease.

The notation of rhythmical nystagmus is, by agreement, the direction of the quicker eye movement.

J. L. M.

Optic nerve atrophy occurs in about 10 per cent. of tabes, Zentmayer (*Old Dominion J. of M. & S.*, Nov., 1915), and its course is 2 to 4 years. It is a primary atrophy but, according to Fuchs, the nervehead sometimes looks as if it were a secondary one. The changes found in the optic nerve are degeneration of the medullary sheath and breaking down of the axis cylinder: the fibers become varicosed and show droplets of myelin and fat. [Query, should this encourage us to give phosphorus when no other remedy is definitely indicated?] The interstitial changes are considered to be secondary.

Any optic neuritis or hemianopsia present is an associated condition due to the common cause, syphilis. Uhthoff is quoted: "Without syphilis there can be no progressive nerve atrophy."

Zentmayer thinks the feeling that it is somewhat hazardous to use mercury for optic nerve atrophy associated with tabes rests alone on empiric grounds.

J. L. M.

Intravenous Medication.—Guy B. Stearns, discussing R. R. Mellon's "The Biological Correlation of the Law of Similars" (a very valuable paper), holds that any direct invasion of the blood is an accident forcing the blood to accept for neutralization that which is harmful as well as that which may be helpful. He has known instances when antityphoid vaccination has done much harm—"because the blood was not prepared to cope successfully with all the substances introduced directly into it."

Although part of a vaccine—which is a complex substance—may arouse protective reaction, other portions lower resistance in other directions. Abderhalden has shown that all tissues have protective ferments that neutralize substances with which they come into contact, and holds that the intestinal mucosa (where these ferments are highly developed) neutralizes the substances not required for the body.—*Jour. Amer. Inst. Hom.*, Jan., 1916.

J. L. M.

CORRESPONDENCE.

EDITOR JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY:

Having extended the courtesy of your columns to an apostle of the "exclusive dogma"—Better Speech for the Deaf—John Dutton Wright, September, 1915—I would ask a similar courtesy at your hands for the presentation of certain well established facts that should always be remembered in the presence of any argument for the education of every deaf child by the "pure (?) oral method."

(1) In these United States only is it possible for the deafboy and girl to acquire a full collegiate education unhandicapped by the deafness. Gallaudet College at Washington, D. C. (formerly known as the National College for the Deaf, but renamed on demand of its students because Edward Miner Gallaudet, son of that Dr. T. H. Gallaudet, who has been represented as putting the curse of the sign language upon the American deaf, was its founder) is the institution where this education is supplied, in speech for those who can grasp it, in signs, for those who can not; and this college has been instrumental in raising the standard of education here above that (for the deaf) in all the rest of the world. No name is so revered by the American deaf as Gallaudet.

(2) The effort to make "pure (?) oralism" compulsory in State schools (as it is in Nebraska) has in the past year been defeated in California and Minnesota through the activities of the educated deaf.

(3) The National Association of the Deaf, with a membership of over 1,600 and having many exponents of oralism, endorses the "combined system."

(4) Many of the most experienced teachers of the deaf, among whom are: E. M. Gallaudet (Pres't Emer. Gallaudet College), Hall (Pres't Gallaudet College), Dobyns (Ex.-Sup't Mississippi State), Rothert (Sup't Iowa), Swiler (Ex.-Sup't Wisconsin), Jones (Sup't Ohio), Clarke (Sup't Washington), Burt (Sup't West. Penna.), Connor (Sup't Georgia), Wright (Sup't Michigan), Rogers (Sup't Kentucky), Milligan (Sup't California), Walker (Sup't Wisconsin), Walker (Ex.-Sup't Missouri), and Currier (Sup't New York), likewise endorse the "combined system."

N. B.—A visit to the New York Institution would furnish material for a very instructive story. (See the boys on dress parade and hear the boys and girls *sing*.)

(5) A noteworthy difference between the educators who endorse the "combined system," and those who do not, is that the former are all qualified both ways and the latter not. Wright has admitted that he has no working knowledge of the sign language.

(6) Speech and lip-reading do not advance hand in hand. If passable speech is the rule, passable lip-reading is the exception; and when it is realized that lip-reading demands intense observation and mental alertness (always some guessing) the "rift within the lute" is located.

(7) At Mt. Airy (Philadelphia), which is cited as a notable example of the conversion from the combined system to the pure oral method, there was an Alumni meeting last summer at which the business was transacted in the sign language; and at that meeting there was an address by Sup't Crouter—also in the sign language. Query: Was the oral method inadequate for the occasion, or was it just an anti-German demonstration?

(8) The American Annals of the Deaf, the accepted authority on statistics pertaining to the American deaf (Jan'y, 1916, issue), shows 14,221 pupils in toto of U. S. schools. Of this number but 2,445 are in the 94 oral schools. Of the 11,776 in the combined system schools 8,267 have systematic oral instruction. This leaves 3,509, or 25 per cent. of the grand total, who do not get it but manifestly not from lack of opportunity. (This fact should be considered along with Wright's estimate that only 25 per cent. of the orally educated, 3/16 of all place real dependence upon their oralism, in everyday affairs.)

(9) The oral enthusiasts make much capital out of the fact that oralism has been the vogue for 100 years in Germany (100 per cent. oral is their boast), but data showing the status, educational and social, of the deaf there is not furnished; nor do they advertise the fact that the German deaf are demanding, and many German teachers advising, recognition of the sign language in their schools.

(10) Lip-reading is the interpretation of *signs*, less definite than those of hand, arm, etc.

(11) Gesture, with or without inarticulate cry, is the natural language of man. This is seen in the first year, or more, of existence;

also in the adult deeply stirred by the emotions (joy, grief, fear, anger, affection.)

(12) Everybody uses the sign language more or less every day. Being natural, it is frequently more effective than speech. By the same token, we have the Photo-play, with its millions of patrons.

From the foregoing, as from my recent communications to the Amer. Acad. of Ophthal. and Oto-Laryngol. (wherein I advocated a general cultivation of the sign language by the hearing as the only altruism worth the name to the deaf, but carrying its own reward in collateral advantages of wide range) any suggestion that I am antagonistic to oralism, per se, is unwarranted. On the contrary, I would have children taught oralism as I would have the hearing taught music. For, regardless of the possibility that the result hoped for will never be realized, or that no more than 1 per cent. of either class would ever be asked to perform a second time, there would inevitably be occasion when this accomplishment, however indifferent in character, would serve a useful purpose.

But when deaf people unusually so accomplished, tell me, as they have, repeatedly, that they are not thus restored to society; and that for the joy of living they must have the sign language, I cannot allow the propaganda for oralism to go unchallenged.

An investigation which will look more to ultimate results than to methods of handling the profoundly and incurably deaf is therefore in order; and it is naturally the province of otologists to take the initiative. They have pronounced the sentence bringing untold grief to the parents of the deaf child; and they should guide these parents in its upbringing so that they may chase no *igneus fatuis*.

H. B. YOUNG.

Burlington, Ia., Feby. 20/16.

REVIEW.

THE MORTALITY FROM CANCER THROUGHOUT THE WORLD. By FREDERICK L. HOFFMAN, LL. D., F. S. S., F. A. S. A., Statistician The Prudential Insurance Co. of America; Chairman Committee on Statistics, American Society for the Control of Cancer; Member American Association for Cancer Research; Associate Fellow American Medical Association; Associate Member American Academy of Medicine. 8vo., cloth, 826 pages, $9\frac{1}{4} \times 6 \times 1\frac{5}{8}$ inches. The Prudential Press, Newark, N. J., 1915.

A very valuable and interesting compilation published by the Prudential Insurance Company for gratuitous distribution to those interested in cancer research and control; 221 of its pages are devoted to "observations and conclusions," 554 to tables, including forms and record and injury blanks, 10 to recommendations and instructions on the control of cancer, 19 of double column bibliography, and the balance in double column indices.

"Verifiable progress in the direction of health and longevity requires the use of the statistical method impartially applied." Statistical consideration of the data from different, although official, sources cannot be made to conform to the most rigid demands of scientific accuracy—because of borderland cases, difficulties in diagnosis, and because there is no absolutely scientific definition of the term "cancer"—yet "the results of the present investigation emphatically prove the imperative need of uniformity in the rules of statistical practice and the adoption of standard forms and blanks for cancer inquiries * * *. The main shortcomings of the investigation are attributable to the want of uniformity in methods of classification and the more or less abbreviated presentation of the original facts provided by the death certificate."

The following may be of interest to some of our readers:

In New York state, outside Greater New York, there were in 1913, 4,313 deaths from cancer: *Pharynx*—(Males) 6 deaths, average age 60. Primary seat: pharynx 2, jaw 2, tonsils 1, mouth 1. Probable cause: smoking 3, tooth-extraction 1, ulcer of gum 1. In 2 there was personal history of alcoholism.

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Cancer of the *throat*—Males 16, average age 66. Primary seat: tongue 3, lip 3, larynx 3, maxilla 2, tonsil, palate, cheek, esophagus and pharynx 1 each. Probable cause: pipe 7, ulcerated tooth 2, trauma 1. Personal history: alcoholism 5, syphilis 1. Females, 5 deaths, average age 62. Primary seat: larynx 2, tonsil, esophagus and thyroid 1 each.

Mortality in the Scottish Widow's Fund and Life Ass. Soc., 1874-1894. *Throat* 9 cases (1.76 per cent.); *larynx* 8 cases (1.56 per cent.); *eye* 2 cases (0.39 per cent.).

Germany—The Friedrich Wilhelm Life Ins. Co., 1885-1889: *Larynx* 16 males (3.3 per cent.) and 1 female (0.6 per cent.) ordinary mortality. Its industrial mortality, same period, was: *larynx* 27 males (1.1 per cent.) and 17 females (0.4 per cent.); nose 2 males (0.1 per cent.) and 2 females (0.1 per cent.).

Karlsruhe Life Ins. Co.: 1900-1905, *larynx* 17 deaths (2.3 per cent.); 1910-1913, 16 deaths (1.9 per cent. of all organs).

Saxon Military Life Ins. Soc., 1903-1906, *larynx* 2 males (1.6 per cent.).

England and Wales mortality from cancer. *Larynx*—1897-1900: males 740 (1.21 per 100,000 population), females 282 (0.43); 1901-1910: males 2,518 (1.52), females 834 (0.47); 1908-1912: males 1,662 (1.9), females 486 (0.5).

Pharynx and throat—1897-1900: Males 891 (1.45), females 334 (0.51); 1901-1910: Males 2,967 (1.79), females 831 (0.47); *pharynx*, 1908-1912: males 1,438 (1.7), females, 406 (0.4).

Scotland, 1906-1910. *Larynx*, males 154 (1.36 per 100,000 population), females 58 (0.48); *pharynx and throat*—males 200 (1.76), females 73 (0.61).

Ireland, 1901-1910. *Larynx*—males 158 (0.7), females 86 (0.4); *pharynx*—males 494 (2.3), females 144 (0.6).

Ireland, duration and mortality of illness in 1901. *Pharynx and throat*—males: 6 mos. and under 13 (34.2 per cent.); 6 mos. to a year, 15 (39.5 per cent.); one to two years, 8 (21. per cent.); over 3 years, 2 (5.3 per cent.); duration not given, 6; total, 44 (100 per cent.). Females: 6 mos. and under, 3 (33.3 per cent.); 6 mos. to a year, 6 (66.7 per cent.); duration not given, 3; total, 12 (100 per cent.).

Sweden, urban and rural, in 1905. *Larynx*—males, 1 (0.5 per

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cent. of all cancer cases); females none. *Pharynx*—males, 3 (0.43 per cent.), females, 3 (0.28 per cent.).

Bavaria, 1905-1910. *Larynx*—males, 183 (0.9 per 100,000 population), females, 45 (0.2 *ibid*).

In Amsterdam, with percentage of all deaths from carcinoma, 1862-1902. Males: *Larynx*—1862-7, 1 (0.3 per cent.); 1872-7, 4 (0.9 per cent.); 1886-'91, 13 (1.6 per cent.); 1897-1902, 35 (2.7 per cent.). *Pharynx*—1862-7, 2 (0.6 per cent.); 1872-7, 1 (0.2 per cent.); 1886-'91, 7 (0.8 per cent.); 1897-1902, 16 (1.2 per cent.). Females: *Larynx*—1872-7, 3 (0.5 per cent.); 1886-'91, 1 (0.1 per cent.); 1897-1902, 1 (0.1 per cent.); *pharynx*—1862-7, 1 (0.2 per cent.); 1886-'91, 1 (0.1 per cent.); 1897-1902, 2 (0.1 per cent.).

Switzerland, 1901-1910. *Larynx*—males, 946; females, 147; total, 1,093 (3.09 per 100,000 population); 1906-1910, 520 (5.8 per 100,000 population).

Hungary, 1901-1904. *Larynx*—males, 390 (1.0 *ibid*); females, 75 (0.2 *ibid*).

Greece, 12 cities, 1905-1908. *Larynx*—9 (males), equals 1.4 per cent. of all cancer deaths, and 2.6 per cent. of male cancer mortality.

Sierre Leone, Colonial Hospital, 1900-1909. All organs, 26 cases; sarcoma of *eye*, 1.

Cape Verde Islands, Hospital da Praia, 1892-1904. *Eye*, 1 black (male), 12 cases, and 1 mulatto (male), 28 cases—treated.

Singapore, Tau Tock Seng's Hospital, 1907-1912. *Pharynx*, epithelioma, 2, 121 cases of carcinoma, sarcoma and epithelioma, all organs.

Australia, 1908-1912. *Larynx*—Males, 121 (1.1 per 100,000 population); females, 15 (0.1 *ibid*); *pharynx*—males, 248 (2.2); females, 25 (0.2).

City of San Salvador, 1912. Throat, 3 (5 *ibid*).

City of Santiago de Chile, 1898-1902. *Larynx and throat*, 12 (1.57 per cent.).

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No. 8

Editorial

1916 MEETING OF O., O. AND L. SOCIETY.

VIEWED from every angle the 1916 Meeting was the most successful in the history of the O., O. and L. Society. The thanks of the Society is due the President, Dr. W. H. Phillips, and his able assistants, the Secretary and the Local Committees in New York and Baltimore. The immense amount of material that was handled in the New York Ophthalmic Hospital is a testimonial for the institution worth mentioning.

On the first day seventy-nine operations were performed by the local and visiting surgeons. That so many operations could have been handled in one day without a hitch, speaks well for the management of any institution, especially one that is confined to the treatment of eye, ear, nose and throat diseases. The New York Ophthalmic has proved to its numerous visitors that for material and management it has no peer in any part of the world. To any one who desires to know where to go for special training in eye, ear, nose and throat disease during the world war and afterwards, the answer is: The New York Ophthalmic.

The Baltimore Meeting was limited to the presentation and discussion of original papers. From the scientific standpoint there never was a better collection of papers and more ably discussed than those presented at the Baltimore Meeting. Every one who attended these two Meetings feels ably rewarded for having been present. The proceedings will be presented in detail in a future number of the JOURNAL. Dr. G. J. Palen, of Philadelphia, was elected President at the Baltimore Session. He has the best wishes of the Society for a successful administration.

MOUTH INFECTION.

SO much attention has been given of late to the mouth as a source of infection that the review of the subject in this issue will afford an excellent opportunity to crystallize the facts in their present status. As in most new subjects, much has been written and concluded that will need the seasoning of a few years before it can finally be selected. However, there is every evidence that the workers in this field have struck upon an important causative condition, and already the accumulation of cases shows that we should at least look suspiciously toward the mouth in many of the diseases, the etiology of which has heretofore been vague. There can be little doubt that mouth infection is the occasional source of certain arthritides (of the deformans type), certain of the anemias, subacute and chronic gastric and gastro-intestinal conditions. The proof of this statement lies in the fact that frequently these cases, which may have been very stubborn toward treatment, are relieved with the improvement of the mouth condition.

On the other hand, too much stress must not be laid upon the mouth infection as a causative factor, that is, too much assurance cannot be accepted that this is the causative factor in any given case. Consider the great number among the poorer classes, who, with absolute disregard of the care of the teeth, have actually foul mouths and yet no evident systemic complication.

In the fresh evidences of the pathogenicity of the ameba of the mouth (*Endameba gingivalis*) there must not be lost sight of the various other factors, any one of which may individually set up a mouth condition infectious to the system—witness the manifestations of malnutrition, syphilis, scurvy, the various spirochaetæ and spirilla, altered salivary secretion, dental caries, and the ever ready bacteria of the mouth. It is evident that many of these conditions may be present in any given case, acting concomitantly or as adjuvants.

D. M.

ABSTRACT ON MOUTH INFECTION.

The question of handling the description of changes produced in the mouth by infection—along lines of the minute pathologic condition, seems much more acceptable when we consider how appear-

ances follow the tissue reaction rather than a type set by a causative agent. This fact is more or less analogous throughout the tract; thus the ulcer from a given streptococcic infection may be shallow, pale and innocent, while again with another strain may be angry, deep, infiltrated, hæmorrhagic and membranous. Much difference of opinion has arisen in the description of disease from a failure to consider the cases cited as an entities to the given individuals—though the disease may follow a type, the minute description of it should be generalized upon these principles.

The abstracts have been selected as complimentary to the general character of the issue.

NEW COLLEGE AT LAHORE, INDIA.

It is with much pleasure that we note the establishment of an Homœopathic College and Hospital in Lahore, India. Being the first institution of its kind in the province, it bespeaks great credit upon those earnest workers who are fostering it in its infancy. The catalogue is complete and gives a distinctive emphasis to the teaching of our school; this naturally is of paramount importance as a cause for existence. With us in America it may be said with fairness and without reflection that the strength of our Colleges should lie in this distinctive teaching. Our science cannot be gotten elsewhere, whereas the other branches of medicine are frequently handled better in the large endowed universities. No apologies are in order, but credit is due to all those who, no matter where they are situated, keep the flame burning to light the way of those following. May the infant effort of our Aryan and Homœopathic brothers be crowned with the successes that their endeavor merits.

D. M.

DR. EUGENE W. BEEBE.

Dr. Eugene W. Beebe died at Milwaukee, December 18th, 1915. Dr. Beebe was born in Canandaigua, N. Y., on February 21st, 1840. When a boy of twelve years he came west with his father. The family lived on a farm south of Madison, and Dr. Beebe received his education in Dane County Public Schools. He was graduated

EDITORIAL.

from the Hahnemann Medical College, Chicago, in 1866, and began practice in Stoughton, Wis. He later removed to Evansville, where he practiced medicine for fourteen years. After special study in New York, Dr. Beebe came to Milwaukee in 1880, beginning practice as an eye, ear, nose and throat specialist.

He was a member of the State Society, a Senior Member of the A. I. H., and a charter member of the O. O. and L. Society. He was also a member of the Masonic Lodge. In spite of his advancing years, Dr. Beebe was progressive in spirit, keeping abreast of the times. He was active in Society work and a ready talker on any subject pertaining to his specialty. He is survived by his widow and a son, Dr. Claude Beebe.

A RESUME OF THE HISTORY OF THE MOUTH AMEBÆ AND THE USE OF IPECAC AND EMETIN.

DOUGLAS MACFARLAN, M. D.

EXPLANATION OF PLATE.

Fig. 1.—Photographic reproduction of that portion of the plate of illustrations accompanying article by Gros in 1849, which depicts his *Amoeba gingivalis*.

Fig. 2.—Photographic reproduction of part of plate illustrating article by v. Leyden and Löwenthal upon *Endameba buccalis* Prowazek, showing organisms in motion.

Fig. 3.—Camera lucida drawings of *Endameba gingivalis* (Gros), stained with iron hematoxylin; *a* and *b* showing the usual central or subcentral position of the nucleus; *c*, *d* and *e*, examples with the nucleus in eccentric position; *f*, *g* and *h*, examples showing nucleus in compressed condition; *i*, an example with two nuclei (it is suspected, although not known, that the small ameba lying within the same space in the stained film had been recently separated from the larger one).

Fig. 4.—Photomicrograph of *Endameba gingivalis* (Gros), stained with iron hematoxylin; from material from pyorrhea pocket.

Fig. 5.—Composite outlines of moving *Endameba gingivalis* (Gros), including five camera lucida sketches; time included, twenty seconds; to show activity of movement and long type of pseudopod at times assumed; magnification as in Figure 3.

Fig. 6.—Photographic reproduction of a text cut of *Endameba kartulisi* Döflein from original article by Kartulis in 1894.

Fig. 7.—Photographic reproduction of text cut illustrating article in 1907 by Verduin and Bruyant, showing *Endameba pyogenes* Verduin and Bruyant.

Fig. 8.—Photographic reproduction of cut of endameba described by Ribbert, here shown in parotid duct.

Fig. 9.—*Endameba mortinatalium*, Smith and Weidman, in minute hepatic abscess; stained with iron-hematoxylin.

THE present stimulus to the study of mouth infection has brought out on retrospection those isolated endeavors of former workers in this field, the work having laid fallow and almost forgotten for years. It seems singular that the fact of the frequent discovery of ameba in the mouth had never in all this time caused the profession to "catch on" to its significance.

Allen J. Smith,¹ who has given much care to work on the mouth ameba, credits to Gros in 1849 the first discovery of an ameba in the mouth. In the article "Fragments d'Helminthologie et de Physiologie Microscopique"² Gros described and pictured the "ameba gingivalis."

"In the midst of the production of tartar on the teeth, there is seen vibrios, a sort of vegetation, that is sometimes very regular; but

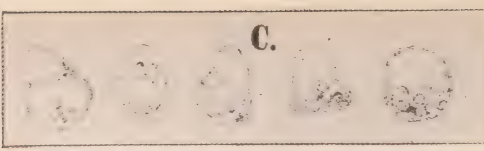


Fig. 1

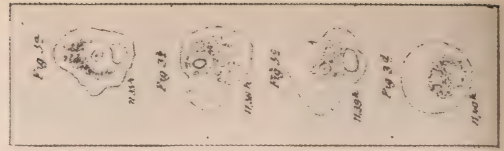


Fig. 2

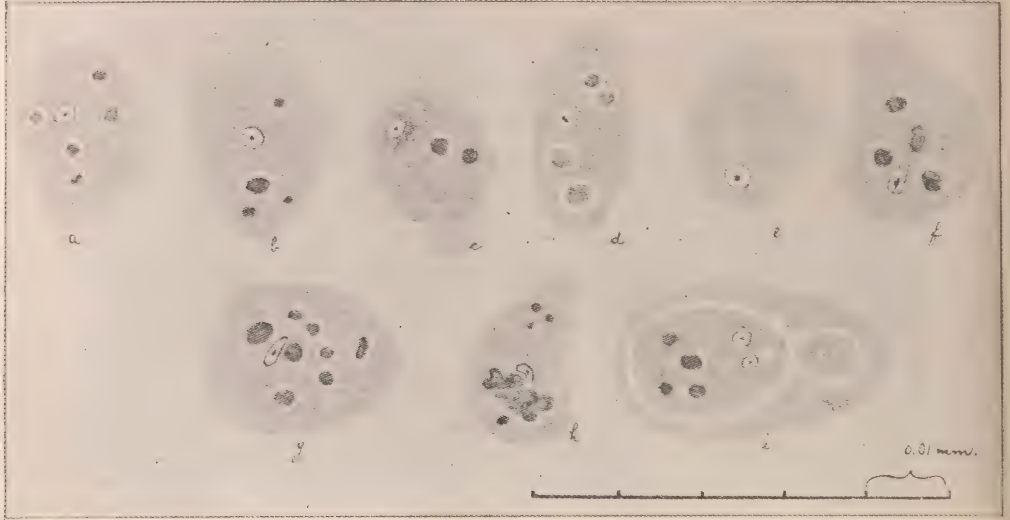


Fig. 3

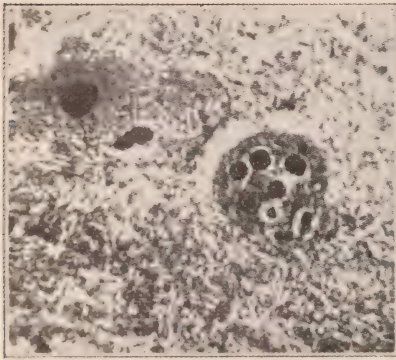


Fig. 4



Fig. 5

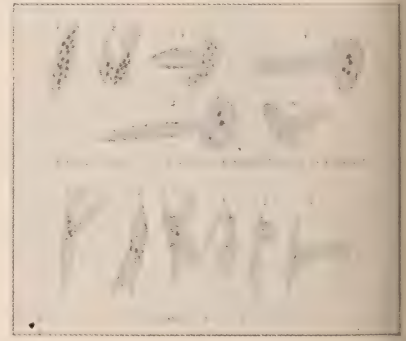
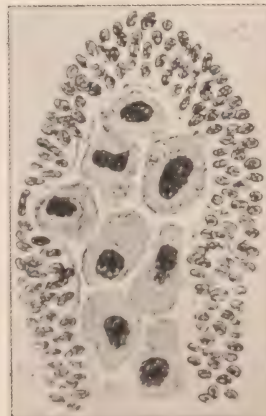
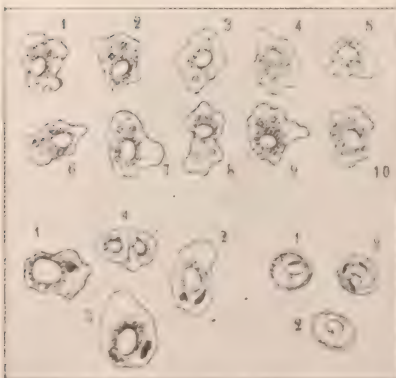


Fig. 6



there has not been mentioned as yet the vesicles that we have pictured in Plate VI, C. These vesicles have a movement so slow and so obscure, that one has to be warned to notice they take all sorts of forms, by an amebic extension and contraction, permitting you, however, to always see the interior of the globules which seems to displace itself somewhat, and being analogous with what we see in certain so-called polygastric infusoria. Their origin, their role and their end is unknown. They are found especially on the internal face of the teeth. Is this then a spontaneous generation?"

In 1862 Steinberg³ found an ameba in the soft tartar and refuse on the teeth that he calls the "*amiba buccalis*." In 1879 Grassi⁴ described an ameba from gingival lesions which he named the ameba *dentalis*. Further observation of oral ameba were made by Brumpt, 1910 and 1913; Flexner, 1892; Verdun and Bruyant, 1907; Bruyant and Pelissier, 1909.

In 1904 Prowazek⁵ described the *Endameba buccalis* and went into details in his description. There was some doubt as to the identity of all these ameba, but Smith sums up the subject in reviewing their work, as follows: "We do not hesitate in spite of the published differences (which we believe are due to non-specific variations), to identify the organism with which we have become fairly familiar, with that of Prowazek. As above indicated, we see no reason to believe the *Ameba Dentalis* of Grassi to be other than the same species, if we may accept identity of habitat, identity of lesion, comparable morphology (as expressed in terms of dysenteric endameba) and the evident later opinion of Professor Grassi as to identity (inferable from his relation with Chiavaros paper⁶). It is impossible to be sure of Steinberg's *Amiba buccalis*, but identity cannot be denied or specifically asserted. The ameba *gingevalis* of Gros is so nearly like the same organism, as shown by his drawings and a few points in the text, that it is impossible to say it is not the same and quite within reason to say that it probably is identical."

Accompanying is the illustration to Dr. Smith's article in the *Journal of Parasitology* reproduced by their kind permission. Figure 1 shows the ameba illustrating Gros' article; Figure 2 the endameba *buccalis* of Prowazek; Figures 3, 4, 5. Dr. Smith's illustrations of the endameba *gingevalis* (Gros).

As to the establishment of the pathogenicity of the mouth ameba,

this work has only been accomplished by the recent researches of Smith, Barrett, Middleton, Evans, and a few others who have confirmed their findings. It has for long been maintained that the ameba were benign, and possibly beneficially phagocytic in the cases of pyorrhea. As lately as 1914⁹ Chiavaro expounded this idea. Difficulties have arisen in the matter of proving the noxiousness of the ameba, from the failure to cultivate the organism *ex corpora*, the inability to establish Koch's postulates, and from the presence of two other factors in the cause of pyorrhea,—bacterial infection and dental caries. It is doubtful if, to many, the ameba will be blamed for the entire role in the disease; many accept it as a positive pathologic factor; many suspect it as pathologic "when they can find it;" others accept it as an additional pathologic factor; and still others think it benign. However, the case in many instances has been definitely proved by the common therapeutic test, for there is no question that Emetin does cause the disappearance of the ameba and the improvement of the conditions where ameba is found. This improvement may be limited by a failure to correct the dental condition, or with the dental condition improved there may remain a bacterial infection that often the emetin will not touch.

The evolution of the use of emetin may be traced from the imperial appearance of ipecac in those countries where the dysenteries are prevalent. This use assumed a more scientific basis when E. B. Vedder⁷ tested the amebicidal and bactericidal powers of ipecac and emetin. The amebicidal power was definite and "specific" but there were no marked bactericidal effects shown; this had been already assumed from clinical experience and was confirmed later by Sir Leonard Rogers and others with the exhibition of the drug in both the bacillary and amebic types of dysentery. According to Sir Ronald Ross, who did so much in the recognition of ameba and flagellates in the Indian Epidemics in 1896, Bardsley, of Manchester, in 1829 was the first to recommend emetin for dysentery (although the alkaloid had been separated from ipecac in 1817). Tull Walsh gave it by mouth in 1891, but it was the careful studies of Leonard Rogers which first established the use of the hydrochloride of emetin in 1912.⁸ Numerous workers have confirmed these good results since that time. This work was with emetin on the dysenteries.

HISTORY OF THE MOUTH AMEBÆ.

In the last four years interest in the subject has turned toward amebiasis in the mouth. The matter came up indirectly from the clinical observations of Hunter⁹ on the systemic complications of mouth infections. A symposium on the subject appeared in the *Journal of the American Medical Association* in December, 1914, and was contributed to by E. C. Roseman, Frank Billings and C. H. Mayo. Numerous articles then appeared from the pens of the practicing profession. These bore the conviction that from a clinical point at least the evidence pointed to the importance of the subject. The flora of the mouth was suspected and the bacteriology of the mouth was reviewed. Naturally vaccine therapy was applied but with little result. The dentists took up the subject from a number of angles,—the care of the teeth, the removal of tartar, the correction of spots of decay, and the relative acidity or alkalinity of the saliva.^{10,11,12.}

Chiavaro⁶ working under the direction of Grassi in 1914 devoted a study to the endameba buccalis, and reported the frequent appearance of the ameba in pyorrhea. He thought the ameba benign.

It was at this point that Smith and Barrett¹⁵ took up the work and established the pathogenicity of the ameba, by the use of emetin. They frequently found the ameba not only in pus pockets of pyorrhea but in the crypts of tonsils. Emetin locally cleared them out.

The articles by these workers and by their co-workers have been numerous. With Kolmer,¹⁴ Smith established the value of emetin in vivo and in vitro, supplementing Vedder's original work.⁷ Bass and Johns, of New Orleans, confirmed the pathogenicity, and introduced the hypodermic use of emetin in order to supposedly get at those deep-seated pus pockets from the tissue side.¹⁶ Middletown and Evans from the University of Wisconsin have developed some new evidences of the complications of endamebic pyorrhea,¹⁷ connecting it with many cases of arthritis, especially of the deformans type, and also with cases of altered thyroid metabolism.

And so the subject stands at the present. It is regrettable that Koch's postulates could not have been fastened upon the ameba as an assurance of its obnoxiousness; but there is a weight of clinical and therapeutic evidence sufficiently strong to convict it. To those of our specialty unfamiliar with the idea that the mouth is a field belonging to us, I have no apology for the length of this review, but offer it

as a witness of the magnitude of the work done on a subject with which we should be more familiar but in which we have taken little part.

D. M.

¹Allen J. Smith and M. T. Barrett: The Parasite of Oral Endamebiasis, *Endameba Gingivalis* (Gros). Jour. of Parasitology, June, 1915, Vol. I, pp. 150-174.

²Gros: Bull. Soc. imp. de nat. de Moscow, Vol. 22, No. 2, pp. 549-573.

³Steinberg: *Sournemenaye meditsina* Kiev, 1862, Nos. 21-24.

⁴Grassi: *Gazetta med. Ital. Lomb.*, Vol. 39 (8th series, Vol. I.), p. 446, Nov. 8, 1879.

⁵Prowazek: *Arbeiten aus d. Kais. Gesundheitsamte*, Vol. 21, p. 42.

⁶Chiavaro: *Abstr.—Dental Cosmos*, Sept., 1914.

⁷E. B. Vedder: *Bull. Manila Med. Soc.*, March, 1911.

⁸*Med. Record*, Feb. 26, 1916, p. 373.

⁹Hunter: *Br. Med. Jour.*, Nov. 19, 1914.

¹⁰T. B. Hartzell: A. T. Henrici, *The Dental Path. Surg. Gyn. and Obstet.*, Jan., 1916.

¹¹W. A. Price: *The Relation of Amebiasis to Pyorrhea Alveolaris*, *ibid.*

¹²The Neutralizing Power of Saliva and Dental Caries, J. A. Marshall: *Amer. Jour. Physiol.*, Feb. 1915 (Abstr. in this issue).

¹³Smith and Kolmer: *Jour. Infectious Disease*, March, 1916.

¹⁴*Dental Cosmos*, Aug., 1914; Dec., 1914. M. T. Barrett. Paper read at the Philadelphia Patho. Soc., Oct., 1914, Smith, Barrett and Middleton. *The Dental Review*, Oct., 1915, Smith and Barrett. *The Dental Cosmos*, Nov., 1915, Smith and Barrett: Emetin.

¹⁵Bass and Johns: *Pyorrhea Dentalis and Alveolâris*, Specific Cause and Treatment, *J. A. M. A.*, Feb., 1915.

¹⁷*Jour. A. M. A.*, Jan. 30, 1915.

A CONSIDERATION OF ACUTE INFLAMMATORY CONDITIONS OF THE MOUTH.

DOUGLAS MACFARLAN, M. D.

I WISH to trace for you what I have long thought an over-looked point in the consideration of the acute inflammatory conditions of the mouth. In short, it is the gradual gradation of the tissue reaction from the mildest to the severest form, *no matter what the etiology may be*. My attention was drawn to this point by recalling a number of syphilitic cases that showed but an innocent-looking congestion of the fauces and soft palate. These were contrasted with those common cases of violent necrosis. In following these manifestations for a number of years and over a variety of conditions, I find myself considering that each case, no matter what the etiology, is largely a case unto itself, and the more I study my cases, the less I set them down "according to type."

Take, for example, the causes that can set up mild inflammation in the mouth and then consider the picture they present. Whatever the cause, the picture may be identical, varying only as to degree, which is the individual factor in the case.

The simplest type of mouth inflammation we find is an acute catarrh where we have the expected conditions of hyperemia and swelling of the mucosa, exuding an excessive amount of viscid tenacious mucus—the epithelium erodes or desquamates in small patches which are very sensitive to the touch. These may be found on the surfaces about or opposite a carious tooth. In more severe forms this shallow pinkish erosion is seen to have thrown out fibrinous exudate, and the little ulcer shows up as a leucoplacia or whitish patch due to this exudate. The margins have a red ring of mild reaction. Thrush fungus, *oidium albicans*, which is occasionally met, gives an appearance much like this aphthous stomatitis, but the tissue reaction is less marked and the ulcers have a whiter, "curdled milk" appearance.

Getting into the cases of severer disease we come to the more truly ulcerative stomatitis. These are seen in those debilitated by a protracted fever, in those poisoned with the metals, lead and mercury, in phosphorus poisoning, in scurvy and in syphilis. Again the lesions

correspond to the severity of the disease and do not follow types. In lead poisoning we have constantly brought to mind the blue line on the gums, but how regularly do we see this? What should interest us more is the degree of tissue damage and the evidences of tissue reaction. In any of these cases we may find them presenting the same symptoms, swelling of the mucosa, boggiess and sponginess and tenderness of the gums, which bleed readily. Between the gums and the teeth a fetid detritus collects; the tongue is usually swollen and furred, the saliva is thick, ropy and usually profuse. The ulcers themselves are not the sordes or aphthous patches of the milder cases but large, raw-red confluent masses, deep cut and with an angry zone of red edema about them. They bleed readily. In the active stage the fibrin formation is not evident; only when they are healing do we see them sealing up with a white coagulation patch.

If we carry the picture to a worse condition we see the gangrenous, edematous, phagedenic, sloughing type, of cancrum oris, Vincent's angina, hospital gangrene and those of any of the violent acute infections. Intense swelling, livid hemorrhagic injection, infiltration of the tissues with blood and serum—a condition in which the onslaught is rapid and extreme; this is the initial appearance of these cases. The vitality of the tissue is soon lost and the tense, indurated swelling turns into a doughy, sodden mass that sloughs away, leaving a deeply eaten ulcer with no reaction toward healing—a gummy, bloody exudate comes from the spot.

Here again the pathological picture is often identical despite the etiology. The point to be made is that in these cases also there is no type to be found; the only basis of comparison is their degree. Vincent's angina may give the same picture as the violent streptococcic case or the same picture as any other case of acute infective gangrene.

Now, one word here as to the question of the false membranes. There has been much discussion of this false membrane as a diagnostic sign differentiating the diphtheritic and streptococcic throat. It has been said that the membrane in the streptococci throat strips without leaving a bleeding surface, in distinction to the diphtheritic membrane. Again it is merely a matter of degree of inflammation, for if in either case the reaction is strong enough, fibrin will be thrown out into the membrane and will bind it to the mucosa. It is true, however, that the usual streptococcic infection is not as violent as the diph-

ACUTE INFLAMMATORY CONDITIONS OF THE MOUTH.

theritic case and less often do we have a membrane bound down. The method is a very insecure means of diagnosis.

With the chronic inflammatory reactions and ulcers arising therefrom, there is more of a possibility of setting them in types, for here we have a time factor that can help us. The course of the chronic ulcers is somewhat characteristic for the type. The broken down gumma, with indurated margin, with loss of tissue, with punched-out appearance and with the few feeble unhealthy granulations and sloughs on the floor, can readily be distinguished from the pale, soft, "mouse nibbled" undermined tuberculous ulcer.

But my plea is for the consideration of the acute inflammatory conditions of the mouth according to the (1) pathology present, (2) the status of the condition at the time (active, healing, stationary or sluggish), and (3) for the local treatment based on these considerations. How often we fail to think of the actual status of the process and futilely aim to strike the etiology,—we ourselves only know. It is the question of viewing results brought on by causes of variable power, and it is not a case of bunching cases according to type when there is no type. Etiology is important, especially in the diphtheritic, syphilitic and tuberculous cases, but in the host of casual acute inflammatory conditions we would do well to follow the living pathology more closely.

PRESENTING A NEW DISCOVERY; AN INFALLIBLE METHOD OF TRAINING THE VOICE FOR PUBLIC SPEAKING OR SINGING.

EUGENE FEUCHTINGER, M. A.,

Author of "The Vocal Organ; Its Mechanism."

IF you were to lose your purse and look for it in places where you have never been, the chance of finding your purse would be small indeed.

In a similar way, it seems to me that we have been looking in the wrong places for a method of successfully training the voice. Among all the many ways which have been heretofore proposed for voice-training two stand out most prominently. They are, Resonance and Breathing. Those that hold to the resonance theory, claim that the volume and quality of the tone is caused through reinforcement in the resonance chambers of the pharynx, nose and head. This theory had much in its favor, for the singer feels a physical sensation, he can place his hands at the place of sensation and prove it satisfactorily to himself. Nevertheless, the theory of resonance as being the cause of good or bad quality, of weak or strong tones, is absolutely wrong.

A good tone is not the result of resonance; just the reverse is true, a good tone is the cause of resonance.

The singer's sensations lead him astray; these sensations are not caused by resonance-vibrations in the head or chest cavities, but solely by the external laryngeal muscles contracting very greatly in their effort to assist the internal laryngeal muscles to stretch the vocal chords. Thus they become tense and, like the sounding board of a piano or the body of a violin, they vibrate together with the vocal chords. The extrinsic laryngeal muscles are attached to the breast bone, hard palate and skull, hence the singer feels the vibrations at these points. Not the air within the cavities causes the resonance, but the parts, muscles and bones, surrounding these cavities. It is not the air which causes the sounding board to vibrate, the sounding board itself swings to and fro and causes air waves of exactly the same number as the tone, but of larger dimensions, hence the tone is larger and the overtones, which decide the tone quality, are strong.

AN INFALLIBLE METHOD OF TRAINING THE VOICE.

As for the methods of breathing, have they not been tried for, lo, these many years without having brought us one step nearer the final solution of voice training? It is utterly impossible to use a different breath pressure for each one of at least twenty-four tones, which are needed by the singer.

When we examine the source of tone in the light of modern investigation, we shall find, that the vocal chords are the first cause not only of pitch, but of volume and beauty as well. But these facts have escaped us because of a long standing belief shared up till now even by physiologists, and by practically all voice teachers, that the thin, whitish membrane, which passes from the arytaenoid cartilages to the front of the thyroid cartilage, is all there is to the vocal chords. In other words, it has been thought that the vocal chords are a fixed, rather small quantity consisting of one single pair of muscles, which might be more or less heavy or light in different persons but which no one could add to.

Very likely this mistake was the cause of the next one, which is, that the stretching of these slender vocal chords was effected solely by those muscles which connect the cricoid cartilage with the thyroid cartilage in front and with the arytaenoides in the rear.

But this thin, whitish membrane which passes in the popular belief for the vocal chords, is only the edge or covering of all the muscles which fill the space between the walls of the thyroid cartilage and it.

All of the thyro-arytaenoides, the crico-arytaenoides and fibres of the arytaenoid-transversus and oblique muscles, together constitute the vocal material.

The older physiologists, Merkel, Harless, Luschka, declare that the vocal chords are not muscles, but hems or borders of vocal muscles; they resemble the fascia which invests nearly all muscles. More recently Dr. Ad. Pansch, professor at the University of Kiehl, Germany, in his book, "*Anatomie des Menschen*," said: "The activity of the laryngeal muscles consists in the expansion and contraction of the vocal lips; all of the muscles are active, with the exception of the crico-arytaenoid posticus."

Cunningham's text-book of Anatomy, Edinburgh, 1913:

"The vocal folds (O. T. true vocal chords) extend from the angle between the laminae of the thyroid cartilage ventrally to the vocal pro-

cess of the arytaenoid cartilages dorsally. The vocal fold is sharp and prominent, the mucous membrane which is stretched over it is very thin and firmly bound down to the subjacent ligament. In cross section the vocal fold is prismatic in form and its free border looks upward as well as medially. The vocal folds are the agents by means of which the voice is produced. * * *

"The Mm. Thyreoarytaenoidei is only separable from the M. vocalis with which it forms a common mass, by artificial means.

"By its action the muscle rotates the arytaenoid cartilage and draws it ventrally in such a way that its vocal process is carried ventrally and medially and the vocal fold is rendered somewhat flaccid. The muscle thus antagonizes the crico-thyreoideus. The main action of the muscle must, however, be that of a constrictor of the supraglottic region of the larynx.

"Nerve supply: anterior branch of the inferior nerve.

"Arytaenoideus transversus is attached on both sides to the dorsal surface of the process muscularis, the lateral edge of the arytaenoid cartilages. Some of the fibres become continuous with the thyroarytaenoideus. It is in this way, that the latter muscle becomes a sphincter of the glottis. By its action it approximates the arytaenoid cartilages.

"Is innervated by the posterior or dorsal rami of inferior laryngeal nerve of both sides.

"The Mm. Vocales (O. T. Internal Thyro-arytaenoid muscles). The vocales muscles of each side is a triangular, somewhat prismatic muscle, which forms with the thyro-arytaenoideus a common mass. Three surfaces. The action of the muscle is to draw the vocal process of the arytaenoid cartilages ventrically, thereby relaxing the vocal fold and ligament.

"Innervation is derived from anterior ramus of the inferior laryngeal nerve." * * *

Six pairs of muscles fill the space between the thyroid, cricoid and arytaenoid cartilages. In a state of rest they lie against the walls of the thyroid cartilage; in contraction, however they straighten from their loosely curved form, shorten and become thick. In this wise they bulge toward each other and close the air tube. When breath is forced against them, not only the outer border, or sheath (the falsely called vocal chords), but the entire mass of muscles within the larynx

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will vibrate together, thus increasing the tone, provided they are stretched sufficiently for the pitch demanded of them. Something similar is artificially accomplished by winding the lower strings of the piano and violin with extra wire, to make the strings thicker and heavier for the purpose of making stronger, larger tones. The combined action of the intrinsic laryngeal muscles to form one compact prismatic vocal fold, as Cunningham so aptly describes it, also fulfills the laws of physics, which state that the volume (and as we shall see, the quality also) of a tone, is dependent upon the quantity of the vibrating material.

A Tone is made up of three elements, Pitch, Volume and Quality. Each separate tone consists of a mathematically determined number of vibrations, any deviation from the exact number of which will change the pitch. Volume and quality are things added to the pitch; they are entirely independent of the pitch. Because pitch is a fixed quantity, we have no control over it. But we can control the volume and thereby determine the quality. Quality, according to the laws of physics, depends upon the number of overtones which are present in the fundamental tone. The fundamental tone must be strong if the overtones are to be felt. A thin tone is inferior in quality because it contains few overtones. If the vocal chords as commonly understood were all that could be made to vibrate, then we should never hear a voice like that of a Caruso or a Tetrassini and the modern opera would have been impossible, because thin voices cannot rise to the demands of dramatic intensity, and so nothing much beyond a tinkling accompaniment could have been used for an orchestra. Musically, we should be wearing the wigs of our grandfathers. It has now been discovered that we have that within us which makes it possible for almost anyone to develop, a voice similar to those of the great artists. The voices of the great singers are an accident of birth; we can rise above accidents and determine our own vocal destiny if we utilize all the vocal material within us.

This is in fact the whole problem of voice training, viz., how adequately to tense the full substance of the vocal folds, and in order to explain Nature's mechanism for accomplishing this end, I must enter rather minutely into detail.

If the vocal chords consisted of the one pair of thin muscles only, as has been believed up to now, then the further belief that the crico

thyroid and crico arytaenoid muscles stretch them, would be entirely justified, for the thin chords would require little stretching effort.

But as we have now learned, the vocal chords are in reality a mass of muscles; instead of being thin, slender bands, they are thick and broad bundles of muscular fibres; it will be apparent, therefore, by merely mechanical calculation, that the crico thyroid and crico arytaenoid muscles are not strong enough to stretch them.

Where then do we get the power to stretch the entire mass of vocal muscles to the required tension for the highest as well as for the lowest tone, without any straining effort?

In answering this question, I propose at the same time a very simple solution of all voice difficulties.

The extra force which is needed to stretch the combined vocal muscles is supplied by the extrinsic muscles of the larynx. These are all those muscles which rise out of the breast and collar bone and pass to the thyroid cartilage and hyoid bone, also those muscles which connect the larynx with the tongue, hard palate and skull.

The muscles rising from the breast and collar bone would in contraction pull the larynx downward. In so doing, no especial force would be brought to bear upon the vocal chords to stretch them, and they would merely follow the downward movement of the larynx. But muscles can contract only to the degree that they are being resisted; they must be strongly resisted in order that they may contract fully. Now the larynx moves freely up or down, consequently the downward pulling muscles contract only if the larynx is at the same time being pulled upward by opposing muscles. The opposing muscles are the palato pharyngei, the stylo hyoid, and the all important hyo glossi muscles. They pass from the rear parts of the larynx upward, while the downward pulling muscles are attached to the front of the larynx. If the down and upward pulling muscles are equally strong, their combined effort will tilt the thyroid cartilage forward and downward upon the immovable cricoid. As the vocal muscles are attached to the inner front edge of the thyroid cartilage, they are pulled downward also. At the same time, and in the same proportion, the ligament and muscles from the rear part of the cricoid cartilage to the arytaenoid cartilages pull backward, of course striving to pull the vocal muscles with them. This combined pulling against one another of the intrinsic and extrinsic muscles, is Nature's mechanism (reminding of the Pulley or

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Hoist) to stretch the vocal muscles and hold them in tension, for all tones and against any breath pressure, so long as the tone or phrase is desired, after which they relax, to jump into instant contraction when a new tone is wanted.

Cunningham's Text-book of Anatomy:

"The extrinsic laryngeal muscles comprise all muscles passing to the os hyoideum, which is physiologically a part of the laryngeal apparatus, as well as the M. sterno-thyreoides. The larynx is so constructed that changes in their relative position and in their degree of tension are brought about by the action of the muscles and the recoil of the elastic ligaments." * * *

When this equal tension is supplied, not only the vocal muscles vibrate but all the extrinsic muscles from the breast bone, the hard palate, and the skull vibrate also. All these combined groups of muscles, vibrating together, produce that large, freely sounding tone, which is the triumph of the great singers and which, I believe, is the just inheritance of all who are willing to work.

To the average person it seems too bad that the fragrance and beauty of the rose can only be enjoyed by surmounting the difficulties presented by its thorns.

If the vocal mechanism which I have so far tried to describe, were perfect in every detail, no very great obstacles would be presented to the public speaker or the singer; all they would need to do would be to memorize, train the ear, acquire a programme and go forth to conquer. The thorns in this case are represented by one single pair of muscles, the hyo-glossi, the muscles that constitute a considerable part of the tongue. They pass from the tongue to the hyoid bone below, and are in reality the mainspring or controlling energy of the entire vocal apparatus. Upon the strength of these muscles depends the volume, quality, range and ease of all vocal efforts and, I surmise, basing my guess upon several years of experience, the state of health of the entire throat region also. The hyo-glossi are, with rare exceptions, the one weak link in the chain of muscles, which operating together produce such beautiful results, but operating only singly or in groups have no appreciable effect on the voice whatever. The almost universal weakness of the hyo-glossi muscles, aside from sociological reasons, arises, physiologically speaking, from the fact that they are nowhere bound to a firmly fixed bone like other muscles. Most

other muscles have their roots in a bone and usually pass into another bone. The contraction of muscles which pass from one bone to another bone, can be plainly felt; not so the contractions of the hyo-glossi muscles. Their upper attachment, the tongue, is a flexible, often spongy, soft mass of muscles; the lower attachment, the hyoid bone, affords no resistance either because the hyoid bone moves freely up or down. For these reasons we do not feel this muscle, we are not even conscious of this muscle's existence. The hyoid bone is in reality a part of the larynx and the muscle connecting it with the tongue, the hyo-glossi, is the most important muscle in the upward pulling process. Now when this muscle is inactive or too weak to do its work, then the downward pulling muscles of the larynx cannot contract fully because they are not being resisted. Consequently the entire chain of extrinsic stretching muscles is weakened. Even the intrinsic muscles cannot contract to their full strength, because they do not find the resistance which a firmly held larynx would give them. Only the extrinsic muscles can hold the larynx firmly, immovably, in its natural position. The result of weakness of the hyo-glossi is a great relaxing and shrinking of all the vocal muscles. The tone becomes thin, breathy and husky, causing irritation, inflammation, and many times complete loss of voice.

The solution of voice training is to be found in strengthening the hyo-glossi muscles. I have discovered a way of doing this by first teaching my students how to isolate this muscle, separating it from all other efforts; then we place a thumb against the tongue, giving thereby the necessary support and resistance. Against this resistance the muscle contracts and is gradually strengthened. Of course this is a silent exercise, but after a few lessons, if the pupil sings or speaks while placing the tip of the little finger at the point of contact of the hyo-glossi with the genio-glossi muscle, he will feel a distinct pulsation upon the finger. The tone will be good, strong and free every time that the pulsation or beat is felt. When the beat is not present the tone is markedly inferior. The beat must be automatic, and is then an absolute proof of the presence or absence of the correct vocal effort. As the tongue becomes stronger, the voice will increase in power, quality and range. The stronger the tongue the easier will be the tone production, and the less breath will be wasted.

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From "Throat and Laryngeal Diseases," by Professor Dr. Kraus, formerly Director of the Royal Charity for Throat and Laryngeal Diseases, Berlin, Germany, 1900:

"Where a certain inactivity of the tongue muscles exists there will be noticed a weakness which often causes stammering and even complete loss of voice. Many years of experience have taught me that such faults can be comparatively easily cured through the right kind of tongue exercises. In this way the hyo-glossi muscles, which alone can stretch the vocal chords, will be developed and strengthened. I have found in my practice that singers with unusually fine voices, have tongue muscles which, unknown to themselves, are very strong and because of this great strength, they could stretch their vocal chords with great power and ease."

Dr. G. Panconcelli-Calzia, Director of the Phonetic Laboratory in Hamburg, and Dr. F. Wethlo, Assistant to Dr. Guttman in Berlin, have closely investigated my method and approve it unreservedly.

Dr. Haenlein, Royal Institute for the Deaf and Professor at the University of Germany, writes: "I am greatly interested in your work. I find that you have made a thorough research into the physiological and anatomical questions of Vocal Science. Anyone who gives the matter any consideration must be convinced of the importance of the tongue muscles."

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THE VALUE OF PERIMETRY. A NEW INSTRUMENT AND SOME EXPERIMENTS DESCRIBED.*

ELMER JEFFERSON BISSELL, M. D.

PERIMETRY has been developed during the past few years more than any other visual test. A large and valuable literature has accumulated and new instruments have been devised. During any period of rapid scientific development it is well at intervals to attempt to classify the accumulated data that it may become more available for practical use and the basis for further investigation. Such an attempt will be made in this paper, a new instrument will be described and some new experiments presented.

What can perimetry reveal?

First—It can reveal the peripheral or eccentric visual acuity if test objects of different sizes are employed. These should be from 1 to 20 mm. in diameter and by them the form field, the blind spot and scotomata may be outlined. It will often be discovered that a scotoma will be absolute or relative depending upon the size of the test object. As well test central vision with only 20/50 letters as eccentric vision with only a 5 mm. test object.

Second—It will reveal much regarding the color sense and the area of the color fields. In this also test objects of different sizes are essential for accuracy.

Third—It can reveal the light sense to some extent if the illumination is varied. The area of scotomata and the size of the form and color fields may change with light and dark adaptation.

Information regarding these three elements of perimetry is frequently of great significance in the diagnosis of serious and often obscure ocular and general diseases. At times it may be of value in prognosis. Such information is not as generally utilized as it should be for three reasons.

*Read at the O., O. and L. Society Meeting at Baltimore, June, 1916.

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First—Many oculists have insufficient or imperfect instruments for making the perimetric tests. Dr. Harvey Cushing says: "Good perimetry depends not so much upon the perimeter as the man behind the perimeter." Nevertheless, good instruments are desirable for accurate and expeditious work. With no one instrument can all the data be secured. Many perimeters are mechanically imperfect and have only a limited range of usefulness.

Second—Faulty methods. Sufficient consideration is not given to the amount of time consumed, the retinal fatigue, the quality of the light, the contour of the face and lids, the size of the pupil (taken with the patient in position for testing), the plane of the iris, the amount of amblyopia, the error of refraction (whether corrected or uncorrected), the difficulties of fixation, the mental reaction or quickness of response of the patient and the manner of changing the size and color of the test objects.

Third—Lack of knowledge of what is physiological and pathological and what may be expected in a given case.

Around these three general hindrances to a more universal employment of complete perimetric tests, it will be helpful to group the data which modern investigation has accumulated.

INSTRUMENTS.

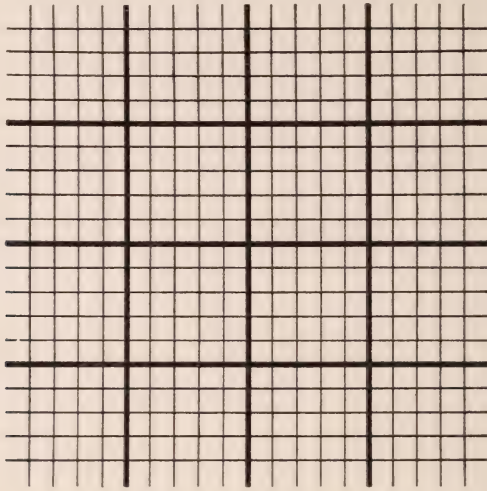
It is well to determine the instruments which are desirable for accurate visual field work, the scope of their usefulness and the mechanical requisites in each.

There are three instruments I consider quite essential,—a perimeter, a stereoscope with Haitz cards and a Bjerrum screen or some form of a campimeter.

Perimeters are best adapted for taking the form and color fields, except when they are contracted to within 10° of the fixation point, and then the Haitz stereoscopic test or Bjerrum screen is more accurate. Most perimeters are least accurate near the center of fixation,—a region where accuracy is most essential. With a good perimeter scotomata 5° from the center can be easily outlined and the blind spot fairly well determined, but not as well as with Bjerrum screen. A good perimeter should be accurately self-registering, the test object which should be easily changeable in size should be at the very inner edge of the object carrier, and the colors should be quickly

changeable without the knowledge of the patient. All of these requirements are found in Hare's perimeter. For small central form and color defects the Haitz test with a stereoscope has great advantages.

DATE.



NAME.

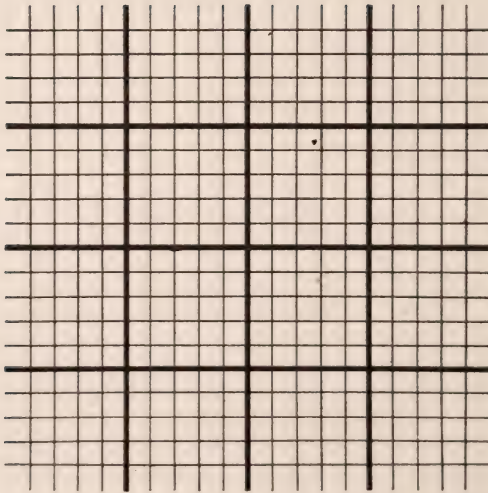
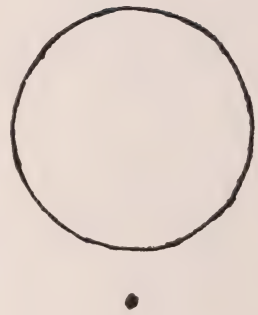
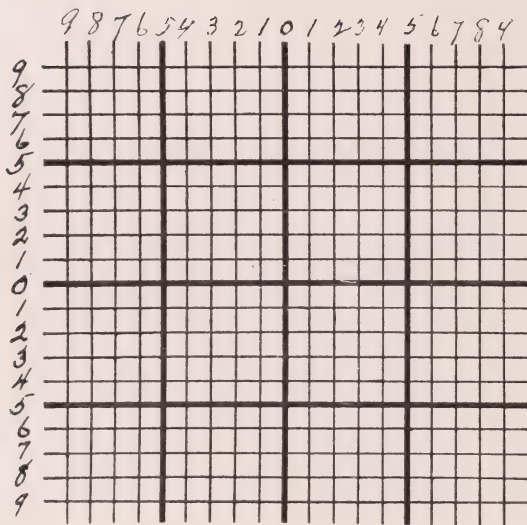
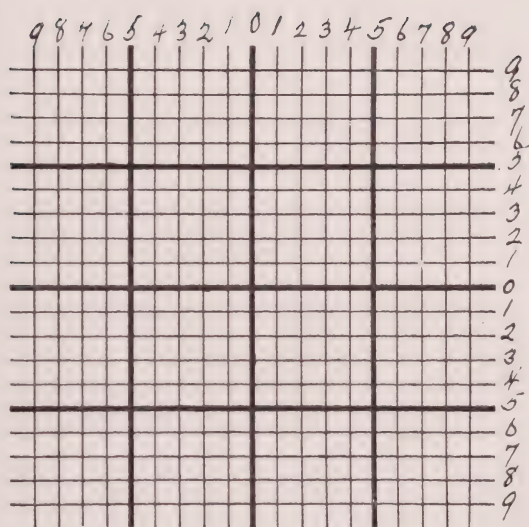


FIG. I.

Author's chart for recording Haitz's tests and author's blind spot measurements.



Author's ster sco
 "The original is a ck



ind spot card.
with white rulings."

especially if the patient has binocular vision. The eye not being tested helps to maintain very accurate fixation and small central or para-central defects within 10° of the center can accurately and more easily be determined than by any other instrument. I use in these tests Dr. Walker's¹ slender 1 to 3 mm. test objects. These have white and green at one end and red and blue at the other. I have had printed some charts, Fig. 1, upon which to record the Haitz tests, and have found the charts of great assistance. By these future records can easily be compared. In order that the comparison may be accurate it is essential that a note be made at the first examination of the distance of the test card from the stereoscopic lenses, and if the lenses are adjustable laterally, the pupillary distance should also be recorded.

I have added to Dr. Haitz's cards one which is about three inches longer than his and this card, Fig. 2, is marked in 3 mm. squares toward each end so that the area of the blind spot may be quickly and correctly estimated and can be recorded in full size and relative position upon the author's chart, Fig. 1.

In using this stereoscopic blind spot card, Fig. 2, it is important to have a stereoscope fitted with about a $+ 5$. combined with a 10° prism. The ordinary stereoscope found in the stores has about a $+ 4$. combined with an 8° prism and these do not bring the entire blind spot into the field of the instrument. The stereoscopes used for training the fusion faculty which contain revolving sphero-prisms are fairly well adapted for this test. The best instrument is an adjustable stereoscope made so that the pupillary distance is changeable. This provides a very wide visual angle. I have had a centimeter scale marked upon the bar along which the card-carrier slides in order to quickly determine the distance of the card from the lenses and a scale on the bar supporting the adjustable lenses to indicate the pupillary distance.

As already suggested the Bjerrum screen is especially adapted to measuring the blind spot and all scotoma between 25° and 5° of the fixation point. All measurements beyond 25° can best be made with a perimenter. Both Dr. Peter² and Dr. Walker³ have devised very ingenious test object carriers to be used with a Bjerrum screen or any campimeter, but I find that the patient is somewhat confused by the motion of so large an area surrounding the color. Therefore generally prefer a long slender black rod into the end of which can be inserted bicolor test objects of any size desired.

One of the great difficulties in all visual field testing is for the patient to maintain central fixation. Binocular vision in the Haitz test helps to secure this. The complementary color method of Herschberg and Schlosser and Dr. Walker's³ macula selector allow central binocular vision on the Bjerrum screen, but these are often inapplicable. To aid in maintaining fixation with one eye I had the Bausch & Lomb Optical Company make what I call a two point alignment instrument, Fig. 3. It consists of an adjustable chin and forehead rest fitted with a frame into which correcting lenses, colored glass, a disk with a central .75 mm. perforation or a blank may be placed. Either side of the frame can be rotated upward independently. From the upright arm supporting the chin rest extends a 40 cm. horizontal shaft upon which a slender perpendicular black rod surmounted by a 2 to 3 mm. black ball or colored disk can be moved, horizontally, vertically or laterally. The patient can easily bring the black ball or any colored disk which may be desired into alignment with the center of the 10 mm. white central disk upon the screen. The mental effort to keep these in alignment is a great aid in maintaining fixation, and furthermore, if the patient wishes to rest for a time and then resume the testing the same position can instantly be resumed, and there is no chance of error from assuming a different position. My screen is marked in degrees for 1 m. working distance. A cord connected to the center of the head-rest support can be extended through a —V— like opening to determine that the screen is just 1 m. from the eye of the patient, and also is in correct position laterally. From the main support of the chin-rest extend two perpendicular rods surmounted by a sighting device which render it very easy to determine when the center of each cornea is on a level with the fixation point on the screen, and also 1 m. distance. If the height of the eye is incorrect it can be overcome by adjusting the chin-rest; if the eye is too near or too far from the screen it can be corrected by moving the forehead support. With this instrument a degree of scientific accuracy is attainable which is hardly possible by any other method.

Black-headed pins are stuck in the screen to indicate the areas measured, and I have had charts made the size of my screen, and the measurements are transferred to these. The large records permit of greater accuracy in comparing subsequent tests, and it is much easier to plot the defects than upon a small chart. Tissue paper is placed



FIG. 3.
Author's two-point alignment instrument.

against the Bjerrum screen, and the location of the pins marked upon it, then it is laid upon the chart and the points are easily transferred. After I had been working for about a year with this two-point alignment instrument I discovered that Dr. Gradle⁴ had been experimenting with a somewhat similar arrangement in connection with a steel ball which could be rolled about on a white celluloid screen by a magnet back of it. This does away with all motion in front of the screen except the steel ball. I have tried this but have not succeeded in doing as rapid work, especially with color defects, as with a good test object carrier.

METHODS.

From the experiences of many investigators and some personal experiments it is possible to formulate a number of helpful suggestions.

1. The contour of the face, the size of the pupil, the plane of the iris, the refraction, and central vision should be noted.

2. Color testing is not satisfactory by artificial light or dull day light. A good north light is best. The form field and any defects for white can be very accurately outlined by artificial light or even by dull day light with the possible exception of glaucoma and retinitis pigmentosa. In fact, with dark adaptation the normal form field may be larger than with a very bright light, and in choked discs with concentric contraction the field may become normal under subdued illumination.

3. A chin and forehead rest is very important in measurements with a Bjerrum screen. In fact, it is impossible to make satisfactory measurements without this aid.

4. Any aid to central fixation is desirable. This may be by the author's two-point alignment instrument, Fig. 3, or Dr. Gradle's instrument, the stereoscope, Dr. Walker's macular selector, or the complementary color method. With a red glass before one eye the test object should be green, with green before one eye the test object should be red, with dark amber before one eye, the test object should be blue. With red before one eye a white test object will look red in an absolute, and grey in a relative scotoma. With this method diplopia fields can be taken. I have not found the complementary color method very satisfactory.

5. The color of the test object should be quickly changeable

without the knowledge of the patient, and it is essential in some conditions to vary the size of the test object. Under normal conditions the size is quite insignificant, but in disease it is very important. Defects for a 5 mm. test object should be examined with a larger test object, and when a 5 mm. can be seen a smaller should be tried. Returning visability for even a 15 mm. or 20 mm. test object may be a very favorable sign, just as improvement of central vision from counting fingers to 20/100 is favorable although the case cannot yet read 20/20. Dr. Walker⁵ has given the following approximate equivalents of test objects and the usual test letters:

5 mm. = letters of visual angle of	17/200
10 mm. = letters of visual angle of	8/200
20 mm. = letters of visual angle of	4/200
2.5 mm. = letters of visual angle of	20/100
1.25 mm. = letters of visual angle of	20/50
.62 mm. = letters of visual angle of	20/30

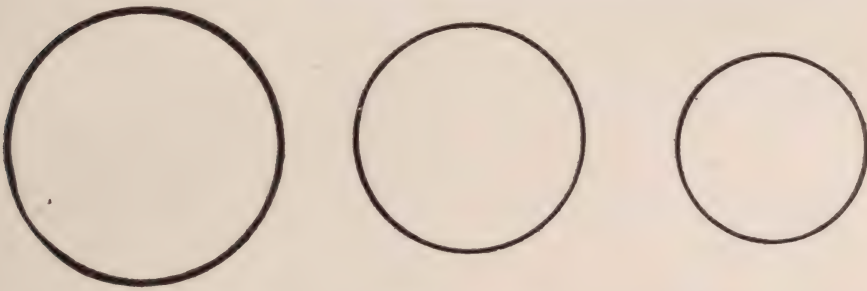
6. Any method to be accurate must be fairly rapid. Prolonged central fixation is difficult, fatiguing and probably has some effect upon the photo chemical reaction so that the measurements for form and especially for color become uncertain.

7. Accurate plotting of these tests is essential if the tests have any significance.

8. As these are subjective tests and the test object is moving the method of signalling when it is seen or not seen merits more consideration than it has received. For it is quite evident that the method which quickest indicates what the patient sees will yield the most accurate measurements, other things being equal. I have experimented in signalling by voice, by pressing a button, lighting a small electric light or ringing a bell, and by raising the fingers. I am convinced that simply raising the fingers is quickest, and has the further advantage of not moving the head when a chin-rest is used. In color testing the voice is best, as any attempt to have a certain motion or number of rings of the bell indicate a color introduces too complicated a mental process.

9. The mental reaction or alertness of the patient needs to be considered in estimating the accuracy of our measurements. In the course of my experiments I discovered an interesting psychological

test and have been classifying my patients into quick, medium, slow. For instance, in measuring the blind spot if the test object is moved from invisible to visible and then from visible to invisible, the two areas outlined should be about the same size, the former, for well known reasons, having a tendency to be slightly larger than the latter. When this occurs it could be inferred that the patient has quick mental reaction, but on the other hand, if there is a very considerable difference in the size of the two tests the patient must be of very slow reaction and probably the correct area of the blind spot is something between the two tests. These diagrams will illustrate the point.



(a) Invisible to visible. (b) Probable normal area. (c) Visible to invisible.
FIG. 4.

This psychological fact having been determined it aids in interpreting all the visual field tests and saves one from wrong conclusions. In a person of slow reaction and tested by only the first method, that is moving test object from invisible to visible, an enlarged blind spot might be inferred and a serious mistake in diagnosis made.

10. Correcting the refraction during some tests has its advantages at times. Errors of refraction have but little influence upon the form field, but in very high defects the color fields may be more definitely measured when the error is corrected. I have found the size of the blind spot in very high hyperopia to be more nearly normal when measured with the corrected refraction. It will also be nearer the fixation point due to the prismatic effect of the glass. The reverse of this would be true in corrected myopia. Presbyopia and hyperopia above two diopters should be corrected in using Haitz tests.

As a result of these observations I have had printed upon the back of Hare's charts, Bjerrum screen charts and my stereoscopic test charts the following data. A check mark, measurement or explanation can be quickly entered at its appropriate place and this information

is invaluable, not only for future reference and comparison with other tests, but in interpreting the test to which it relates.

- | | | |
|--------------------------------------|---|---------------------------------------|
| 1. Contour of face | } | Normal. |
| | | Unusual. |
| 2. Size of pupil | | (In position for test.) |
| 3. Plane of iris | } | Back. |
| | | Normal. |
| | | Forward. |
| 4. Mental reaction | } | Quick. |
| | | Medium. |
| | | Slow. |
| 5. Method of signal | } | Voice. |
| | | Light. |
| | | Bell. |
| | | Finger. |
| 6. Day light. Artificial light.... | } | Bright. |
| | | Medium. |
| | | Dull. |
| 7. Size of test object | } | Form field. |
| | | Color field. |
| | | Scotoma. |
| | | Blind spot. |
| 8. Direction of test object | } | Visible to not visible. (V. to N. V.) |
| | | Not visible to visible. (N. V. to V.) |
| | | |
| 9. Refraction | } | Corrected. (C. R.) |
| | | Uncorrected. (Uc. R.) |
| 10. Distance of stereoscopic lenses. | } | To test card. |
| | | Pupillary. |

PHYSIOLOGICAL AND PATHOLOGICAL DATA.

There is much in this part of the subject which is under discussion and investigation, but, on the other hand, there is much that is definite and practical and should be more generally utilized.

Normal Tests.

1. The form field is not appreciably influenced by the size of the test object or the refractive error nor does it contract under subdued illumination, but for dark adaptation may become even slightly larger.

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The temporal field is slightly more active than the nasal, and the horizontal than the vertical.

2. The color fields are influenced by the quality and quantity of light, the visual acuity, the color saturation of the test object, and the manner in which they are taken as has already been suggested. Every effort should be made to prevent the patient trying to guess the color. With reduced illumination there is concentric contraction for blue, red and green. Green would be first lost.

3. The blind spot is an absolute, but negative scotoma in the temporal field. It is about 15° from the fixation point, slightly further on the right than the left side, and is somewhat oval in shape. It is

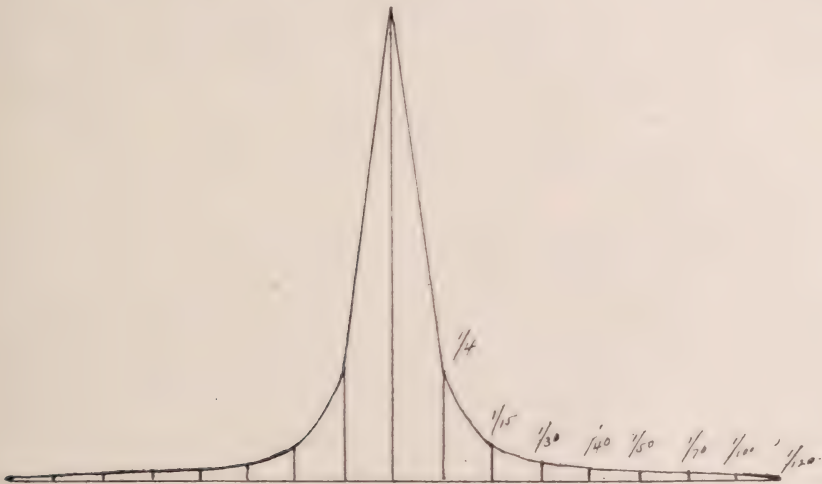


FIG. 5. (Dor.) Visual acuity at periphery of retina.

approximately $5\frac{1}{2}^\circ$ in its horizontal, and 7° in its vertical diameter, and the larger portion lies below the horizontal plane of the fixation point.

The area of the blind spot for white is uninfluenced by subdued illumination the size of the test object or by errors of refraction except when of very high degree. In two cases of seven diopters of hyperopia in young people the blind spot was enlarged, but was normal with correcting glasses. In myopia there may be a tendency to show enlargement toward the fixation point. In progressive myopia this change may be more positive than the ophthalmoscopic appearance of the fundus. In hyperopia the blind spot is further from the fixation point

and nearer in myopia, and if these errors are corrected the size of the blind spot may be the same but its location will have changed in a direction and an amount depending upon the prismatic effect of the lens,—toward the fixation point with a + lens and away with a — lens. Blue and red will give nearly the same test as white except at the temporal side of the blind spot where there is a tendency for the area to increase. Tests with green are unsatisfactory.

4. The macula in complete dark adaptation may present an absolute and positive scotoma which becomes relative as illumination is increased and then quickly disappears. The macula is, therefore, not as well equipped for seeing in the dark as the eccentric parts of the retina. In this connection it is interesting to note the visual curve as worked out by Dr. Dor, Fig. 5.⁶ This would indicate that at 5° from fixation the visual acuity is reduced $\frac{1}{4}$, at 20 it is reduced to $\frac{1}{40}$.

Abnormal Fields.

(1) Form and color. (2) Hemianopsia. (3) Blind spot. (4) Scotomata.

It will be impossible within the limits of this paper to give in detail the visual field changes which occur in quite a large variety of diseases. In only a few diseases can these changes be said to be typical. So varied are these perimetric tests that an entire paper could be written regarding any one disease, and therefore, I shall confine myself to a brief outline of the principal facts.

1. Form and color fields. In disease the size of the test object and the character of the light are important and should always be noted. Disease of the retina and optic nerve are apt to most effect the red and green fields, and the choroid to influence the blue. Concentric or irregular contraction of the fields is not typical of any particular disease. A nasal step is quite common in tabetic atrophy, but is also found in glaucoma. In 10% of tabetic atrophy a central defect may precede a peripheral. Color interlacing may indicate a brain tumor, but care must be taken to exclude hysteria. A tubular field is diagnostic of hysteria, and although it may be much contracted, the patient gets about with very little difficulty.

2. Hemianopsia. Since visual field work has taken on greater accuracy many unusual and interesting reports of hemianopsia are appearing. It may be present in intracranial hemorrhages and tumors,

fracture of the base of the skull, tabes, syphilis, arterio-sclerosis and even in toxic conditions. It often has great localizing value. Binasal hemianopsia is much more common than was formally supposed, and even altitudinal hemianopsia has been reported in tabes, ethmoid disease and, as might be inferred, in embolism of the inferior or superior artery of the retina. The usual inference is that homonomous hemianopsia is due to some lesion posterior to the chiasm, and in either binasal or bitemporal hemianopsia the cause of the disturbance is in the region of the chiasm. Bitemporal defects are more common than binasal, but it must be borne in mind that both of have been reported in bilateral central lesions, although it is very rare that the defect involves a complete half of the visual fields. Drs. Walker and Cushing⁷ have offered a very interesting explanation of binasal hemianopsia in some cases. They have suggested that dilated ventricles may push the nerves against the carotid vessels.

3. Blind spot. No phase of this subject has received more attention than the significance of enlargement of the blind spot when outlined with white blue and red, and especially with the test objects of different sizes. In some diseases, particularly ethmoiditis, an enlarged blind spot is quite common. An enlargement for color will often precede that for white and occasionally a relative central scotoma will be present. It has been suggested that an enlargement of the blind spot in sympathetic irritation might be found. I have only tested two such cases, but detected nothing abnormal. In toxic amblyopia the blind spot may be enlarged, but a central or paracentral scotoma is much more significant. It is in connection with glaucoma that an enlargement is of greatest diagnostic value. Some go so far as to say that a normal blind spot excludes glaucoma. This is probably not true, but certainly it is a fairly constant symptom, and if carefully outlined and is considered in connection with the contraction of the form field, is the most reliable guide as to the progress of this disease. It is interesting to watch the blind spot in choked disc as its gradual enlargement indicates an increasing involvement of the surrounding retina.

4. Scotoma. They may be absolute or relative; positive or negative. Not infrequently a scotoma may be absolute for some color and relative for white. It is often essential to employ test objects varying from 1 to 20 mm. With increasing frequency scotoma are being dis-

covered in toxic conditions resulting from diseased sinuses, tonsils, teeth, intestines, kidneys and septic wounds; also from alcohol, tobacco, tea, coffee and certain drugs. Many of these are central or paracentral with a tendency to include the blind spot. It may first appear for green and red, then for white. And if it is discovered early it is apt to be oval and extend slightly more into the temporal or upper field. Scotoma may be present in syphilis, tabes, glaucoma, choroiditis, chorio-retinitis, congenital amblyopia hemorrhages, eclipse blindness, electric and lightning shocks, migraine and hysteria. They may be found in any portion of the visual field and vary greatly in outline.

¹Archives of Ophthalmology, Vol. XLII, page 577.

²Archives of Ophthalmology, Vol. XLIV, page 416.

³Archives of Ophthalmology, Vol. XLII, page 577.

⁴Annals of Ophthalmology, Oct., 1915.

⁵Archives of Ophthalmology, Vol. XLIV, page 369.

⁶Lohmann: Disturbances of the Visual Functions, page 43.

⁷Archives of Ophthalmology, Vol. XLI, page 559.

DISCUSSION.

HERBERT D. SCHENCK: To discuss this paper as its merits demand is beyond the power of the writer because he has not attempted any work along this line and has none of the instruments mentioned by Dr. Bissell in actual use. He has felt for some years that there was much more in perimetry than most of us were getting out of it. Until very recently the instruments were so defective that it was hardly worth while for one to try to do any accurate work in scotoma.

Dr. Sheppard has several times called the attention of the Society to his ability to diagnose hysterical and other nervous conditions, particularly from the contraction of the blue field. I have verified that several times, twice within the past year. It seems to me that it is a valuable bit of perimetry which will be increased by the more accurate instruments described in this paper.

The objects used in my perimeter tests have been usually for form fields, either a white square of 9 or 5 mm. I have never used smaller than 5 or larger than 12 mm. In color tests the objects have usually been 5 mm. square. For test objects of 10 mm. or more, I have not found moderate refractive errors made much difference in the form fields.

I have felt in numerous instances that my diagnosis was probably faulty because I was unable to ascribe to any condition found in the fundus or in the refraction of the eye, the reason for the defective vision. I have some two or three cases in mind that have been under treatment recently where it would seem to me that the loss of vision was greater than it should be from appearances shown with the ophthalmoscope after the refractive errors had been corrected as carefully as possible. With careful instruments it might have been possible to have made a more accurate diagnosis and with that probably a better prognosis. The old instruments, however, are not sufficiently accurate so that one can get the patient in position and hold the head there long enough to insure accuracy for the measurement of a scotoma or secure the proper fixation by the patient, so that your results are in any sense accurate.

The instrument devised by Dr. Bissell for maintaining fixation with one eye has great value and ought to be fitted to the perimeters when taking the fields as he suggests, beyond 25 degrees. To the writer it would seem that the ordinary testing of color fields is somewhat defective because of the fatigue caused by prolonged effort at fixation.

Few of us have the advantages that Dr. Bissell has of a trained assistant who relieves him of many of the details of this work. From the care that must be given to these cases, it would seem to me that one could not, except in exceptional cases, make all these tests in the ordinary case of glaucoma. In brain surgery where there is hemianopsia the perimeter offers great possibilities for diagnosis and in localizing the position of the hemorrhage, tumor or fracture.

Some months ago I had an opportunity while in Rochester of seeing the instruments which Dr. Bissell describes here and some of the charts of the blind spot and scotomas in interesting cases which have recently been plotted. The work seemed to the writer to be very interesting, to be done accurately, to have great possibilities, and the Society should congratulate itself upon having among its members one who is able to give the time and has the assistants to carry out such valuable research work. The writer would like to have Dr. Bissell state whether much of this work can be used successfully in ordinary routine work. Is it possible for the doctor or the patient to spare the time for these extensive tests?

G. W. MACKENZIE: This is a valuable paper; I can merely express my commendation without attempting to criticise. I would like to ask Dr. Bissell, however, whether he finds the blind spot more often vertically elliptical than circular, as shown in the upper illustration. In the little experience I have had in this work, I have generally found it so.

E. J. BISSELL: That is correct; the charts show them to be elliptical, do they not? That chart above, with the three circles, is only diagrammatic.

PRESIDENT: If there is no more discussion, I will ask Dr. Bissell to close.

E. J. BISSELL: As to the question whether oculists in general have the time to do this work, I would reply: Yes, if they get their perimetric work systematized. When once that is arranged it is surprising how much of it can be done in a limited time, even without the services of trained assistants. Of course, you can do still more with assistants and the information gained and recorded is certainly of the greatest value.

When you come to Bjerrum's screen work, then you are going at something that does take more time. That is an instrument for exact scientific work or for a special case in which you want to make an exhaustive examination.

If you are blessed with a good lady assistant, who is interested in the work and has been long enough with you to become familiar with the technique, she can do the work for you. I have such a one, and it is to her I am indebted for these charts.

At least a doctor can scarcely be excused for not having and making use of Haitz charts. By their aid you may be able to detect toxic conditions.

As to the size of the blind spots, a great many measurements have been made and they show that it is longer in a vertical direction than in a horizontal one. It may be slightly oblique. In fact, it may be just as irregular as your optic disk, and all you men know how irregular that is. Some will be almost circular. The myopic cases may be longer horizontally.

G. A. SUFFA: What is the distance from the eye to your test?

E. J. BISSELL: With the Bjerrum screen I work at 1 m. distance. Rochester, N. Y.

EXAMINATION OF CEREBRO-SPINAL FLUID.*

NEIL BENTLEY, M. D.,

THE earliest record of withdrawal of the cerebro-spinal fluid by lumbar puncture is that of Dr. J. L. Corning, an American doctor, in 1885. The credit is usually given, however, to Quincke, a German investigator, whose first paper on the subject of spinal puncture appears in 1891. The subject was so well treated by this author that his name is probably rightly associated with the entire subject of cerebro-spinal fluid investigation.

The cerebro-spinal fluid occupies the space between the dura and the arachnoid. It is thus in contact with the periphery of the brain and cord, and probably communicates with the ventricles, although there has been found no free communication. Upon the subject, however, there is quite a little conflicting testimony. Most workers, however, agree with Mott that the spinal fluid is a true secretion of the choroid plexus cells.

The normal reaction of the fluid is slightly alkaline and capable of reducing Fehling's solution due to the presence of glucose or dextrose. There is some protein present, traces of globulin and albumose.

Normally the appearance of the spinal fluid is clear like water. The normal cell count is seldom above 8 per cubic millimeter, most of which are small lymphocytes. It does not clot on standing.

The usual contra-indication for spinal puncture is brain tumor, especially when the tumor is located in the posterior fossa of the skull. It is claimed that the tumor may, as a result of the removal of the fluid, encroach upon the vital centers in the floor of the fourth ventricle, causing respiratory or cardiac failure. In such a case the fluid removed should be immediately replaced by an equal quantity of sterile normal saline, at the same time raising the foot of the bed.

The technic of lumbar puncture ought preferably to include a preliminary saline laxative, unless the bowels have naturally moved freely on the morning of the puncture.

*Read at the O., O. and L. Society Meeting at Baltimore, June, 1916.

The skin over the back should be prepared as for any surgical operation, washing with soap and water, followed by alcohol and ether, or the parts may be simply painted with the tincture of iodine.

The puncture is made at a point opposite the posterior superior spines of the ilium, using either the third or fourth lumbar interspace. If the patient is able to sit up, it is easier to have him sitting sideways on a chair with his back well bowed over. The more the back is arched the wider will be the lumbar interspace. If the patient is confined to bed, draw him well over to the edge, so as not to allow the mattress to sag; bend the knees well up on the abdomen and arch the back. It is usually easier to enter the canal in the exact middle line between the lumbar spines, going straight forward with the needle, using a rather sudden thrust. Some prefer going in on the right side, pointing the needle to the patient's left and slightly upward. After going through the skin a bony obstacle is often encountered, but by feeling with the point of the needle the foramen is discovered. It is usually easy to determine when we have entered the canal by the sense of giving way of the needle.

I have tried injecting cocain or novococain into the skin and deep muscles to anesthetize the parts, but it does not seem to have any material effect in decreasing the sum total pain of lumbar puncture. Ethyl chlorid may be used. As a rule, the first lumbar puncture is not very painful, and the patients do not complain very much. Where it is necessary to perform it several times on the same patient it frequently gets to be dreaded. If the patient is very obstreperous, it might be necessary to use nitrous oxide or primary ether.

The needle should be about 11 cm. long, with 1-1.5 mm. bore and provided with a stilet. The point should not be too long, yet I prefer one moderately sharp, and personally use a steel needle. Some use one made of flexible material.

It seems hardly necessary to add that absolute aseptic technic must be used, both in the performance of the puncture and in the collecting of the fluid. It is usually better to get the fluid in two portions. We can thus tell whether any blood obtained was in the fluid before puncturing or after.

Any one who has done even a few lumbar punctures, probably has had the experience of failing to obtain any fluid. The usual cause of this is that the needle is not in the canal. It may be not quite

through, or it may have gone clear through and is stuck in the cartilage on the anterior wall of the canal. Moving the needle backward or forward as the case might be, will overcome such a trouble; or the needle may be plugged up. This may be relieved by reinserting the stilet. In case there is a fibrinous exudate into the canal or very thick pus with low pressure of the cerebro-spinal fluid, it may be that the fluid will not or can not flow out. There will usually be enough in the needle to allow for at least some examination. If the patient will take a deep breath the flow will often start. Still I have had cases where we could see the fluid in the needle, yet none would flow out. This is more apt to occur when the puncture has been done a few times.

Then there are some cases where there will be a dry tap. This has been demonstrated by putting in another needle above the first one and introducing normal saline, which flowed out of the lower needle. Under no circumstances should any suction be used.

The pressure of the cerebro-spinal fluid shows such marked variations, even in patients who are perfectly normal, that we are unable to attach any great importance to its changes. I personally estimate it by the rapidity of the dropping. A U shaped mercury tube may be used, but I have never employed it.

As to the number of cells, I like Kaplan's classification. The maximum limit for normal cell count is 8 lymphocytes per cmm.

Border line count 9-15 per cmm.

Pathologic increase 15-60 per cmm.

Hyperlymphocytosis 60-250 per cmm.

Acute meningitis cell count 250-2,000 per cmm.

This scale can not be rigidly adhered to, of course, yet I find it of considerable value.

The Fuchs-Rosenthal or Buerker counting chamber, staining with methyl violet gives not only an accurate count, but enables one to estimate the ages of the cells. (Most cells are intensely basophilic lymphocytic.) Those cells taking up the stain indicate a fresh irritation while the pale cell is an element incapable of function, and is a stage preceding its complete dissolution.

In determining Protein excess the Phase I reaction of Nonne and Apelt is commonly used. Take 2 c.c. of cerebro-spinal fluid and mix it with 2 c.c. of neutral saturated solution of chemically pure ammonium sulphate. In three minutes compare this with a tube of

cerebro-spinal fluid. If there is an opalescence or any turbidity in the first tube, the reaction is said to be a positive Phase I, indicating an excess of protein.

In the Ross Jones method one c.c. of cerebro-spinal fluid is floated over two c.c. of concentrated ammonium sulphate solution. If a ring even of hair-like fineness occurs in three minutes, it indicates an excess of globulin. Then there is also the gold chlorid method of Lange which is much more complicated.

Now in the study of the spinal fluid, we notice that there are certain changes that take place quite constantly whenever there is any pathological change taking place in the cerebro-spinal system. These changes vary considerably in individual cases. However, I believe them to be the most constant and the most reliable symptoms we have to depend upon. I believe them to be so dependable, that upon positive spinal fluid alone a diagnosis can be made. To be sure there must be a free communication from the source of irritation to the sub-arachnoid space and thence into the intracranial canal. Hence it is that at times the cerebro-spinal fluid may show nothing pathologic, yet a post-mortem will show extensive changes all through the brain and meninges. Adhesions or fibrinous exudate block the avenue of communication. This, however, is decidedly the exception.

TABES.

I wish now to take up the serological findings in a few of the conditions otologists are likely to encounter. The first class of cases I wish to take up is tabes.

Here, globulin is seldom found in excess, Fehlings' solution is promptly reduced, but the cell counts is usually increased. The increase in 425 cases reported by Kaplan showed 98% lymphocytes; and ranged in number from 25-95. The majority were between 37 and 73. The Wassermann reaction, either on the blood or spinal fluid, is usually positive.

In tumors of the spinal cord, or other conditions exerting pressure on the cord, we find a very marked increase in the amount of protein matter, without there being, however, any pleocytosis. Bacteria are not found.

CEREBRAL ABSCESS.

In a cerebral abscess which is well encapsulated there will be no abnormal findings in the cerebro-spinal fluid. Very commonly

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there will be some accompanying meningitis, which is apt to be localized. This, of course, will show in the findings. Yet it will not be as marked with the serosa or diffuse purulent form. There may be, however, an increased cell count and globulin increase without there being any clinical evidences of meningitis. Sugar, however, is present and culture and smears are negative for bacteria.

TUBERCULAR MENINGITIS.

In tubercular meningitis we are much more apt to get a cell increase consisting of lymphocytes. Polymorphonuclear forms usually indicate a mixed infection. Globulin is usually not greatly increased, unless a severe tuberculous meningitis or a mixed infection is present.

The ability to reduce Fehlings' solution is quite apt to be present in this form of meningitis quite different from the septic form.

The fluid, especially in the earlier stages, is usually perfectly clear. The tubercle bacillus can usually be shown.

MENINGITIS SEROSA.

The next condition I wish to take up is meningitis serosa under which I group those cases often called meningeal irritation or secondary meningitis. Those are the cases often seen in nasal sinus infection—otitis media, septic endocarditis; infectious fever as—pneumonia, scarlet fever, typhoid, etc. The cerebro-spinal fluid often shows but little change, but if the irritation is great enough may show a very great increase in the cell count. Globulin is not usually in excess, although it may be, but Fehlings' solution is promptly reduced. No bacteria are found in meningitis serosa spinal fluid. The findings of bacteria definitely remove the condition from the meningitis serosa class.

SEPTIC MENINGITIS.

Finally, I come to the septic meningitis, a condition so important for the otologist to recognize. It is here that the spinal fluid examination is of such great value. There are two forms of inflammation, the localized and the diffuse. As to the exact difference between these two types, we find much disagreement among the authorities. Some good men make this distinction: if your patient dies we have a diffuse purulent meningitis. If he recover, then it is positive proof there was present no diffuse purulent meningitis. Certainly such a means of diagnosis does not stimulate one to attempt much in the line of treatment.

On the other hand, is the view of Kaplan, page 91:

"We may have a localized meningitis in which there will be no change in the cerebro-spinal fluid, but if the protecting barriers break down one no longer deals with a circumscribed disease, and the bacterium becomes apparent either culturally or in the smear. The latter findings mark the existence of a diffuse cerebro-spinal meningitis. We are justified in distinguishing between the diffuse and circumscribed forms of meningitis micotica. I consider the absence of an accepted meningitis serology such as a pathologic pleocytosis-globulin in excess, etc., as the distinguishing feature between the circumscribed and the diffuse forms of the disease. The presence of these manifestation, and above all, the findings of the exciting micro-organism remove the disease from the class of the circumscribed meningitis."

One thing we must remember, namely, we can not determine the extent of inflammation by ocular inspection at the time of operation. Many cases show distinctly local lesions upon post-mortem. Yet upon microscopic examination of the meninges, inflammation changes can be demonstrated through a large area of the cerebral meninges, and often down into the cord. In other cases, the chief alterations are found in the ganglion cells of the cord. If the macroscopic examination even at post-mortem is not accurate, how much less accurate is the opinion at the time of operation.

Nor is clinical evidence alone conclusive. All of the symptoms of diffuse purulent meningitis may be produced in a case of pneumonia where post-mortem examination discloses very little pathology.

On the other hand, I have seen cases of diffuse purulent meningitis which presented almost no symptoms up to forty-eight hours of death. Therefore, I believe we must depend fundamentally upon the spinal fluid examination. Clinical symptoms are valuable as confirmatory symptoms. I wish to quote Anders on the point.

"In the light of our present knowledge of laboratory methods, meningitis is to be regarded as one of the few diseases in which this means of diagnosis is the only reliable one. A microscope study of the cerebro-spinal fluid obtained by lumbar puncture is a positive means of diagnosis and of differential diagnosis."

We must remember also that there are not sharp absolute distinctions between the different varieties of meningitis. The entire process is usually progressive. Thus we may have a localized purulent

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meningitis with a surrounding meningitis serosa. However in the localized purulent meningitis we often get but little change in the serology. There may be globulin increase, some cellular increase and slightly cloudy fluid. None of these are as greatly developed, however, as in the diffuse purulent meningitis. Here we get a great pleocytosis, pus cells and leucocytes with the polymorphonuclear predominating. Globulin is increased and there is no sugar reaction. The fluid is acid in reaction, increased in amount and cloudy, often with the appearance of pure pus and clots on standing. Bacteria are present both in the smears and in culture. This picture stamps the case positively as a case of diffuse purulent meningitis, independent of other clinical symptoms.

CONCLUSION.

What then should constitute a spinal fluid examination? Remove about 20 c.c. of spinal fluid in two portions.

(1) Note the character of the fluid (clear or cloudy) and any color.

(2) Make smear and culture for bacteria.

(3) A cell count, total and differential, noting the presence of any blood.

(4) Treat for globulin increase, using the Nonne and Apelt, and Ross Jones methods.

(5) Acidity test.

(6) Test for sugar, using Benedict's or Fehlings' solutions.

(7) Wasserman for syphilis.

(8) Test for clotting.

All of these tests should be made in any spinal fluid examination. Upon the basis of their findings, we can arrive at an accurate diagnosis in a large percentage of cases. In others we will obtain valuable corroborative information. In many instances we will thus get our first suspicion of a beginning meningitis. I believe we can cure septic meningitis in a certain percentage of cases, but if we are to do so we *must* diagnose the condition at the very beginning. Prevention is possible and is our chief object, but I have not the time to dwell upon this point. But purulent meningitis can be cured if seen early enough, and spinal puncture offers us the most reliable means of diagnosis at our disposal. I do not believe it is given sufficient attention, hence this paper.

DISCUSSION.

(Dr. G. J. Palen not present; his discussion not sent.)

H. D. SCHENCK: After hearing this paper it may be interesting to hear that at the meeting of Congress of Surgeons it was said that the increased success they had had in brain abscesses and other conditions involving increase of pressure was due to the fact that they had kept down the pressure by daily withdrawals of the cerebro-spinal fluid.

They showed cases during the congress where the history of the case and its whole course showed that death was drawing near, were operated on with recovery. The unusual success was attributed to the practice of withdrawing a certain amount of the cerebro-spinal fluid daily and thus keeping the pressure within normal limits.

G. W. MACKENZIE: I arise to compliment Dr. Bentley on his able presentation of the subject of spinal puncture as an aid to diagnosis. Dr. Bentley and I had our training at the same place and we were taught to examine the cerebral spinal fluid in all cases of suspected intra-cranial complications, either before or at the time of operation on the mastoid; and I have followed that rule ever since, and, no doubt, Dr. Bentley has also.

From the cerebral spinal fluid we can learn a great deal; however, I have in mind three conditions in which findings are somewhat similar, for which reason there may be some confusion in the diagnosis. They are tuberculous meningitis, serous meningitis and a centrally located abscess of the brain, and, I might add, labyrinthine supuration. All of these conditions have in common a clear cerebral spinal fluid with increased pressure and an increased mononuclear cell count. Recovery of the tubercle bacillus is not always easy in tubercular meningitis. Again, it is possible to have two of these conditions associated, furthermore, in brain abscess the findings may vary from day to day; for instance, in the earlier stage of abscess, we may find the mononuclear cells without bacteria; some days later it may show polynuclear cells and bacteria. The second finding would indicate that the abscess had reached the surface of the brain or ruptured into the ventricles. I do not know whether Dr. Bentley referred to the coagulation of the fluid, as I arrived somewhat late to hear the whole paper. It is typical for tuberculous meningitis to have a clear fluid at

the time of puncture, but after standing for several hours a fine thread-like coagulum will collect in the fluid, which never takes place in the normal.

F. G. RITCHIE: I understood the essayist to say that he never found a case of positive Wassermann in the cerebro-spinal fluid which was not also positive in the blood.

NEIL BENTLEY: You understand, Doctor, I do not make these tests myself. I said that we had been taught that Wassermann was better and more delicate in the fluid and would show positive there when the blood would not show positive at all. In all of the cases I have analyzed (too small a number to draw sweeping conclusions), if the Wassermann was positive in the fluid, I found it positive in the blood. This merely shows that for routine work. The blood Wassermann is not less accurate but more accurate than Wassermann's on the spinal fluid, which is the opposite of what I had been taught. In doubtful cases both tests should be made.

F. G. RITCHIE: The idea is that after the spirochetes have left the blood, they penetrate to the cerebro-spinal fluid. I had a case that appeared to be tabes. I sent him to hospital and had a Wassermann test of the blood made with negative result. Then I had the test made on the spinal fluid and it was positive. I then sent the patient to a neurologist who pronounced it tabes.

NEIL BENTLEY: Did the same man make both tests?

F. G. RITCHIE: Yes.

BURTON HASELTINE: In all probability a syphilitic patient who is treated thoroughly will come to a time when the blood will be negative to Wassermann while the spinal fluid will still be positive. In the early stage the fluid would be negative and the blood positive simply because entrance is made through the blood.

As to the practical, diagnostic value of lumbar puncture and examination of the fluid everyone must acknowledge that it is very great. It is my personal opinion that we are all under great obligations to Dr. Bentley for bringing the subject before us in so able a manner.

The question also comes up as to the use of lumbar puncture as a means of relief when there is great pressure, due to brain tumor or other brain lesion. We have been cautioned as to the danger of this

procedure very gravely. Personally, I believe that danger has been greatly exaggerated. Of course, caution is essential. It should be done gradually, and if you are so fortunate as to catch the patient in the interval between, it is safe to do it once. Repeated and indiscriminate withdrawals should not be done. After you have made your one puncture, keep your patient in an ice pack, so to speak, for forty-eight hours. Draw no more than you are obliged to; do it once, do it in the interval between exacerbations, and keep patient packed afterward and it is a safe procedure.

G. W. MACKENZIE: In regard to the Wassermann reaction of the spinal fluid in tabes, I would say that tabes is not an active syphilitic condition. It is the aftermath of a syphilis that long before preceded. A tabetic patient did have syphilis at some previous time, at which time there was a syphilitic meningitis. It is the subsequent contraction of the membranes on the posterior roots that produces the trouble. So you may have tabes in a patient with negative Wassermann.

NEIL BENTLEY: I appreciate the commendations of the gentlemen who have praised my paper.

Withdrawal of the spinal fluid for treatment or as a means of relief I have not gone into. Like Dr. Haseltine, I think the danger has been exaggerated. It is being done quite commonly in our hospital and we have no trouble or have had none as yet. I think too few physicians are familiar with the technique and the value of the procedure. When I do it in a private house I take pains to have none of the family present at the time, and, personally, I have had no trouble from it.

I am glad Dr. Ritchie mentioned his case. I have been taught so often that the Wassermann reaction was more accurate and delicate on the cerebro-spinal fluid than on the blood. Yet in the cases I have run across, it has not turned out so. I only mention this to bring out the fact that as a routine procedure it would seem that the blood test is the more accurate. In doubtful cases it is preferable to do both.

I was struck with the fact that the valuable information afforded by the fluid was not taken more advantage of. We have a lot of records at our hospital, made by the same men for the last two years, but I did not find them of much value, because not enough data were kept.

To show the value of spinal fluid examination, permit me to cite the following case: It is that of a woman who complained of severe

EXAMINATION OF CEREBRAL-SPINAL FLUID.

headaches. She was a patient of one of my friends, who is a very able man. He referred her to the pathologist for a Wassermann. This was performed on the spinal fluid. The spinal fluid showed a very high polynuclear count, pus and bacteria. From this the pathologist diagnosed meningitis. An immediate consultation was held with two men of national reputation, one of them being a neurologist. They would not accept the diagnosis of meningitis, but insisted upon a repetition of the spinal fluid examination. The second test confirmed the laboratory diagnosis. Here, then, was a case in which septic meningitis was not even suspected and which presented no diagnostic symptoms except in the spinal fluid. I could cite other similar cases, but this one will suffice. Don't fail to examine the spinal fluid in all suspicious cases.

Detroit, Mich.

THE ETHMOID LABYRINTH.*

H. M. SAGE, M. D.,

FOR many years the accessory sinuses of the nose have attracted the attention of the rhinologist, but it is within a comparatively recent time that the ethmoid labyrinth has claimed the special consideration which it is receiving to-day. In this discussion there will be no attempt to further any particular view in the anatomy, histology, pathology or treatment of this group of air spaces. Instead the theories of the different workers will be discussed in an effort to eliminate the errors and bring out more plainly that which stands the test of actual experience.

It is necessary that there be a clear understanding of the anatomy. The ethmoid cells are situated in the lateral body of the ethmoid bone between the nasal cavity and the orbit, the frontal and sphenoid sinuses, and the floor of the cranial cavity and the middle turbinate.

In detail Mosher says the labyrinth is outside the cribiform plate and rises one-eighth in above it. Posteriorly it is partly free in the nasal cavity and in part united to the front face of the sphenoid. Anteriorly it is bounded by the posterior and inferior surface of the ascending process of the superior maxilla and by the posterior surface of the internal angular process of the frontal bone. The cells are divided by the attachment of the middle turbinate into two groups, the anterior and posterior. The attachment of the middle turbinate begins anteriorly in front of the unciform groove, roughly about one-third the distance down the groove and in the region of the ridge of the ascending process of the superior maxilla called the "agger nasi." After bridging across the unciform groove the attachment starts directly downward to form an angle of about forty-five degrees with the sphenoid sinuses. Three or four small cells radiate from the upper part of the unciform groove under the middle turbinate. A third of the distance down the unciform groove in front of the region of the "agger nasi" is a cell, sometimes two, the "agger nasi" cell or cells. The posterior boundary of the unciform groove is the bulla

*Candidate's thesis.

THE ETHMOID LABYRINTH.

ethmoiditis which consists usually of two cells, upper and lower. The upper opening into the groove of the ethmoid bulla and the lower into the middle of the third meatus through the middle of the attachment of the middle turbinate. The third or middle meatus has three openings, the upper, the middle, which was just described, and the inferior. The upper leads to a cell which expands upon os planum for its base and extends upward to the roof of the labyrinth. The inferior leads to a cell which also extends upon the os planum and upward to the roof and backward to the anterior wall of the sphenoid sinus.

Loeb, to whom must be given considerable credit for his work on the size and location of accessory sinus, does not agree in the regularity of size and numbers of the ethmoid cells. For the whole labyrinth he gives the average size as anterior, posterior 35 mm., supero-inferior 31.6 mm., lateral 16.3 mm. Anterior ethmoids, anterior posterior 21 mm., supero-inferior 25.6 mm., lateral 14 mm., posterior ethmoid, anterior posterior 22.3 mm., supero-inferior 23.3 mm., lateral 14.7 mm. The lining of the cells consists of periosteum which is continuous with the periosteum of the nasal cavity covered with a very delicate layer of epithelium. Like the lining of all the sinuses the blood supply is very poor.

The function of ethmoids as of the other sinuses is doubtful. Man in his primeval state required an acute sense of smell and the sinuses provided a greater distribution of the olfactory nerve. During the process of evolution these become less developed until now we have only remnants of functionary organs. However useless, this labyrinth is an organ of olfaction; according to Holmes, it still in a non-inflammatory state takes its place in the physiology of the body. Its function is two-fold. Its air spaces are non-conductors of heat, cold and other irritants to the delicate structures of the eye. Secondly, restriction of the nares by this body, which is covered by erectile tissue, assists in tempering the inspired air. This does not explain why this body is not a solid bone which might perform the same function. At least the air spaces make the bones of the face much lighter and still preserve the necessary contour of the face.

To facilitate the study of the pathology of this region, the following classifications will be given:

ETHMOIDITIS.

A—Acute.

- 1—Catarrhal.
- 2—Purulent.

B—Chronic.

- 1—Hyperplastic.
- 2—Suppurative.
- 3—Atrophic.
- 4—Secondary.
 - a—Syphilis.
 - b—Tuberculous.
 - c—Neoplasms.

There seemed to be little discussion as to the cause of the acute types of ethmoid disease. The acute catarrhal ethmoiditis is a result of the continuance of the same inflammation in the nasal mucus membranes. The pathology is simply the dilatation of the blood vessels with increase in size and number of mucous cells, also the presence of serum in the tissues. The acute purulent type is the progressive stage of the same inflammation. After the serum extravasation there follows a leucocytosis and a migration of leucocytes through the capillary walls. These leucocytes together with exfoliated epithelium, bacteria, etc., are thrown out into the cell cavities. The presence of the pus in these closed spaces tends to macerate the mucus lining thereby increasing the destructive process.

The question may arise why all cases of acute rhinitis are not followed by acute inflammation of the ethmoid cell lining. Undoubtedly the greatest factor is anatomical anomalies within the nose. These consist of impacted hypertrophied middle turbinates pressing against the hiatus similunaris and high deflections of the septum producing the same condition. When the ventilation and drainage of the labyrinth is complete, involvement seldom follows an acute rhinitis, but as soon as the ostia ethmoidalies are occluded by surrounding tissue, the secretions are retained which, as stated above, tend to increase the reaction.

Ballenger summarizes these facts in his diseases of the vicious circle. Other writers for several years have mentioned the relationship between the two conditions, but have given it little attention as to the prevention and recurrence of attacks. During the influenza epidemic of the last year, I have had an opportunity to study this condition in the University Hospital clinic, and have found that about

ninety per cent. of all cases of acute ethmoiditis were situated on the convex side of the deflected septum. In this so-called age of preventative medicine properly selected nasal surgery might be very serviceable in this very conspicuous cause of ethmoid disease.

Of the chronic types of ethmoiditis, the hyperplastic and suppurative are the more common. These two are spoken of together because a great many workers consider them inseparable, that is, one is primary and the other is secondary. Uffenorde insists that the primary forms are hyperplasia without suppuration and suppuration without hyperplasia, but admits that due to occlusion secondary pyogenic infection may occur with polyposis. Woakes in his early work advanced the idea that the primary condition was necrosis of the bone, and that the polypi grew out from the necrosis. Later Grunwald and others thought that infection and suppuration were primary and the hyperplasia was secondary. Clinical experience seems to substantiate Uffenorde's theory. The first change in the hyperplastic condition is a polypoid degeneration of the mucous membrane over the ethmoid body as well as the mucous lining of the cells. Sometimes, too, this is continuous upon the membrane of the middle turbinate and even to that of the inferior. This polypoid condition increases until there is a general polyposis of the nose. Later the ethmoid bone is involved sometimes by reabsorption and sometimes by regeneration. The cause is considered to be a constant irritation of the part by contact of tissues, lack of drainage and recurrent infection. A very noticeable fact is that in most cases drainage and ventilation are seriously impaired either by the hypertrophied middle turbinate or thick and deflected septum.

Chronic suppurative ethmoiditis is an unresolved acute purulent inflammation being brought about by improper drainage. It is sometimes an infection occurring in the polypoid disease when drainage is again interfered with. There seems to be no particular bacteria found in these conditions. Cultures from cases in the clinic show different strains of staphylococcus, streptococcus influenza bacillus, diphtheroids and pneumococci. The colon bacillus has also been reported. The conclusion is that any of the pyogenic organisms common in acute infections of the nose may be found in this chronic condition.

In many cases of atrophic inflammation of the nasal mucous membrane, there is also a diseased condition of the ethmoids. This

relationship so often occurs that a special form of atrophic ethmoiditis has been named. There is some question whether the atrophy is secondary to the ethmoid disease or the ethmoid degeneration to the general atrophic condition. Grunwald was the first to advocate the idea that ozena was secondary to chronic empyema of the ethmoid. This was held for some time, and is even to-day by some workers. Since his first report, his work has been substantiated by many clinicians, but their work was never controlled by histological and post-mortem findings. Alexander in 1909 brought forth the more universally accepted present day opinion that atrophic ethmoiditis was an atrophic bone disease, and that the relation between atrophic ethmoiditis and ozena rested upon the fact that in both the bony walls are involved. It remains a fact, however, that we find many cases of atrophic disease of the ethmoid with a small affected area about the ostia of the bone cells. In these cases it seems certain that primary pathological condition is in the labyrinth, but it does not rule out the possibility that an original focus might be elsewhere in the nose and later involve the ethmoids, making them the secondary condition.

At the present time there is considerable bacteriological work being done as to the origin of atrophic rhinitis, and it is quite probable that the etiology will be blamed upon the already overworked bacteria.

The last of the chronic forms of ethmoiditis is that due to constitutional disorders, namely, syphilis, tuberculosis and neoplasms. These require not much discussion as their pathology here differs little from other portions of the body. It is essential, however, that we bear them well in mind that we may recognize and differentiate them in order that they may receive their proper treatment.

The symptomatology and sequelæ represents a complex which is ever presenting some new and interesting phase. It includes symptoms of toxemia, atrophy, necrosis from extension of inflammation, disorders in other parts of the body resulting from a focus of infection and a series of reflex nervous phenomenon. Acute catarrhal and purulent conditions represent clinical pictures which are very similar. Usually following an acute cold they present the symptoms of that disease with great pressure sensation over the root of the nose sometimes with pain extending into the eyes. When there is marked retention of secretions, there is even sensitiveness to pressure over the ethmoid region. Intranasal examination reveals a swollen edematous

membrane in the region of the unciform groove. Often glary mucus may be seen escaping from beneath the middle turbinate or that body may be bathed in the mucus, or if the condition is purulent, pus may be seen in the same region as the mucus. Sometimes due to extensive swelling no secretions can be seen until the tissue has been depleted. Shrinking of these tissues usually gives marked relief from the symptoms.

Occasionally the symptoms become more grave, the soft tissues about the eyes become swollen, there is exophthalmos, infection of the conjunctiva and limited ocular movements. This occurs without perforation of the orbital wall in the acute purulent cases, but if surgical interference is not timely, perforation takes place and orbital abscess results. In which case the exophthalmos becomes greater, the already edematous tissue becomes more swollen turning from a red to a livid hue and the motions of the eye become more restricted. The abscess usually points in the nasal angle of the orbit, discharging the contents and leaving a permanent ethmoidal fistula.

Every rhinologist with an extensive practice has met with these cases, and the literature is crowded with reports. The complications usually mentioned are meningitis and neuritis of the optic nerve. Guntzer reports a typical case in the Laryngoscope. The case was a child complaining of no other illness, the eye was displaced and there was marked swelling of the surrounding tissue. The fundus showed optic neuritis and the vision was reduced. Complete extirpation completely cured the case and restored the vision.

The symptoms, primary and secondary, of chronic ethmoiditis are so numerous that a numeration of them would give a better conception of the complexity of this disease. With the hyperplastic type there is found the heavy dull pain across the nose extending into the eye, morning headache, fits of sneezing and a watery discharge especially at meal time. Intranasally the membrane of the middle turbinate and beneath it appears swollen and pale showing polypoid degeneration. As this degeneration increases, polypi occur which interfere with breathing and the discharge increases and usually becomes purulent. When the polyposis is extensive, a broadening of the nose occurs. Various reflex symptoms occur such as cough, asthma and pain in various parts of the head. One case in the clinic had had asthma for weeks so that she could not lie down at nights. After the removal of both

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middle turbinates, which showed much polypoid degeneration and exenteration of the ethmoids, her symptoms were relieved. She even said her breathing was better before the operation was finished. Her asthma was completely cured and it did not return during her attendance at the clinic. Nearly as interesting are cases of severe headache. A case, Mrs. M., had suffered from severe headache for months, and at times the pain was so bad that the patient was uncontrollable. The only rest she secured was under the influence of morphine. Examination showed both middle turbinates hyperplastic and impacted. The membrane over the ethmoid body showed the polypoid condition. After first repairing the deflected septum both middle turbinates were removed and both labyrinths opened. Her pain was immediately relieved and there has been no recurrence for eight months.

Chronic purulent disease is characterized by the same sensory symptoms of pain and pressure. Examination of the nose discloses the middle turbinate covered with pus which dries and forms large crusts. The inferior and middle fossa may also be filled with these scabs. The sequelæ are orbital abscess, optic neuritis, optic atrophy, meningitis, arthritis and mental disturbance. It is suppuration of the anterior cells necrosing through into the orbit that is usually responsible for the orbital complication. I have already reported a case of this kind under acute conditions.

Peters' opinion is that the disease of the posterior cells affecting the nerve at the foramen is the cause of the optic nerve atrophy, the nerve being effected sometimes by actual pressure, by actual continuity of inflammation and by absorption of infectious toxins. The peripheral fibres are affected first and the macular which are in the center of the nerve are the last to be involved. As a result a concentric contraction of the visual field is produced. This concentric contraction is often a valuable aid in diagnosing obscure cases of posterior ethmoiditis.

Meningitis while a rare complication has been reported. As soon as necrosis has extended as far as the optic sheath, it is easy for infection to follow that structure back into the meninges. However, due to nature's ability to wall off these infections, meningitis is not commonly met with.

At the present day when so much is being said about arthritis being secondary to a focus of infection, it is not strange that the

ethmoid should come in for its share of blame. It had been quite definitely proven that infections of the accessory sinuses have been foci producing acute arthritis. In a report of the Rhode Island Hospital, the removal of the foci in the sinuses aided in the treatment of rheumatism in many cases, although it was not demonstrated that the ethmoid alone was responsible for any of this trouble.

There is little doubt but that there is a relationship between chronic ethmoiditis and mental disturbance. Whether any other chronic infective process would not have the same depressive effects has not been ascertained. Dowling has noticed a tendency towards suicide in several patients. Winslow reports a series suffering from insanity being cured by exenteration.

For convenience the treatment of ethmoids will be divided into non-operative and operative. The non-operative is applicable to acute cases, to chronic cases after surgical procedure, in chronic cases where constitutional conditions prevent radical procedure. Operative treatment is indicated as a prophylactic for acute conditions, in acute conditions where local treatment fails, in chronic conditions when not contra-indicated by constitutional disturbances.

It is in the acute catarrhal and suppurative conditions that local treatment is required. As these conditions usually follow acute rhinitis and are due to improper drainage, our aim should be to reduce inflammatory reaction and re-establish proper air space. Applications of anti-pyrin have been used, cocain and adrenalin solution applied by swab or spray is useful, and of more recent years argyrol has become more popular. With the two former solutions the tissues are depleted and the drainage improved, but the blood is driven from the capillaries which is not desirable, as good blood supply is necessary to assist in the inflammatory reaction. Argyrol on the other hand, has the advantage of shrinking the tissue, not by contracting the capillaries, but by removing the mucus from the cells and the serum from the tissue. It also has antiseptic property. Clinically the fine results received from argyrol treatment have proven its value.

At the present time considerable attention has been directed towards suction treatment. This is accomplished by using a vessel with a small tube extending to the nose. Atmospheric pressure is reduced within the vessel and nose which causes the discharge to flow from the

sinuses into the nasal cavity. Coffin has an apparatus by which he forced medicated vapors into the sinuses at the same time.

In taking up operative treatment a word must be said of prophylactic surgery. By prophylactic surgery is meant the establishing of proper air spaces in the nose which will prevent most cases of ethmoiditis. This includes correcting deflected and thickened septums and hypertrophied turbinates.

As to the operative treatment upon the ethmoid labyrinth itself, it might be said that there are as many methods as there are surgeons. The procedures have varied from simply opening and draining intranasally to a complete removal through an external incision. The early intranasal technique was usually to remove the middle turbinate and in a haphazard way to open as many as possible of the cells. This varied from an incomplete paracentesis to a complete and dangerous curettage of the whole region without any definite method of procedure. Mosher in an elegant description of his operation gave the first technique that was founded on an actual understanding of the complicated labyrinth. In substance his procedure was to remove a small part of the anterior end of the middle turbinate, to puncture agger nasi cells and work back through this opening. Hejek a short time later also reported a very careful method of curettage. His method is to work with local anesthesia, to enter the anterior cells and work backward. His point is to have all his work in view and a definite plan of procedure. He advises repeated sittings until the condition is cured.

Lack, of England, heartily disagreed with this method, saying it was too slow and fitted only for a surgeon who lacked courage enough to work under a general anesthesia. He advised ether anesthesia, a complete removal of the middle turbinate, and thin curettement of all the cells with long sweeps of a heavy current. He reports at the same time several deaths from this operation performed by other surgeons. He also lost one case.

The external operations have been based upon the technique of Killian with various modifications. It consists of a horseshoe incision along the prominence of the brow down over the bridge of the nose and out upon the superior maxilla. An opening is then made through the nasal bone and the entire labyrinth removed. This operation is be-

THE ETHMOID LABYRINTH.

coming quite unpopular because of its unpleasant cosmetic effect and its results are no better than a careful intranasal operation.

The different operations are indicated by the individual condition. An acute purulent inflammation usually will require only an opening of the anterior cells, while a chronic purulent one will require a more careful curettment. In the hyperplastic conditions a careful removal of all the hyperplastic lining is indicated. The external operation is more often indicated with chronic frontal sinus complications. However, the success of any of these methods depends upon a definite understanding of the regions worked upon and careful and painstaking work.

Ann Arbor, Mich.

PARALYTIC STRABISMUS: A SIMPLE AND ACCURATE METHOD OF DETERMIN- ING THE AFFECTED MUSCLE.*

F. G. RITCHIE, M. D.,
New York City.

WHILE there is nothing new under the sun, and while the underlying principles and phenomena attending ocular paralyses are ones with which we are all more or less familiar, their correlation may render their interpretation either easy or difficult, depending upon their arrangement. This fact has been forcibly impressed upon me, and each recurring lecture season has but served to intensify it.

In dealing with the subject under consideration, I would recall, for the time being, a few of the essentials necessary to the ready appreciation of the method which I am about to submit.

The first is the test object. This should consist of a vertical luminous band or streak, approximately five millimeters broad and fifty millimeters long, obtained through an aperture of those dimensions in an enclosed box or hooded chimney, behind which aperture is secured a piece of opal or ground glass, back of which is a suitable source of illumination. This form of test object will allow one to readily appreciate the position and inclination of the false image.

A red glass should be held before the deviating eye in order to enable the patient to more readily differentiate the images, and thus enable the examiner to determine without loss of time to which eye a particular image belongs. The use of the red glass is, however, not essential.

The patient should be placed at from three to six meters distant from the test object, the center of which should be at the level of the eyes when the head is erect. The examination should be conducted in a darkened room.

The extreme positions of the field may be obtained by moving the patient's head in a direction opposite to that of the particular por-

*Read at the O., O. and L. Society Meeting at Baltimore, June, 1916.

tion of the field desired, should one wish to determine the inclination of the false image, or accentuate the separation of the images.

APHORISMS.

1. The secondary deviation is greater than the primary.
2. The image of the sound eye is always vertical.
3. The projection and inclination of the false image corresponds to the normal action of the muscle affected.
4. The separation of the images increases in the direction of the action of the paralyzed muscle.
5. The vertical recti muscles govern the height of the cornea when the eye is turned outward, and the inclination of the vertical meridian when the eye is turned inward.
6. The obliques govern the height of the cornea when the eye is turned inward, and the inclination of the vertical meridian when the eye is turned outward.
7. A pathological divergence is increased on looking upward, and a pathological convergence is increased on looking downward.

Having briefly reviewed the essentials, we are in a position to interpret the phenomena accompanying a paralysis of a given muscle, whether the same be partial or complete. I have confined my claim to a single muscle, but have, on numerous occasions, demonstrated a paralysis of two or more muscles of the same eye by the same method.

As will be seen, the method is a simple one: the answers to the following four questions will enable one to determine the muscle affected.

1. Is the diplopia homonomous or crossed?
2. Is the false image higher or lower?
3. What *is* the inclination of the false image?
4. What *should be* the inclination of the false image?

CROSSED DIPLOPIA.—A crossed diplopia with images on the same level indicates a paralysis of an internal rectus muscle, the false image belonging to the affected eye. If in addition there is a difference in the height of the images, one of the vertical recti muscles is affected. If the false image is higher, it is the superior rectus of the opposite side; if it is lower, it is the inferior rectus of the opposite side.

HOMONOMOUS DIPLOPIA.—An homonomous diplopia with images on the same level indicates a paralysis of an external rectus, the false

image belonging to the affected eye. If in addition there is a difference in their height, one of the oblique muscles is affected. If the false image is higher, it is the inferior oblique of the same side; if it is lower, it is the superior oblique of the same side.

Putting the foregoing statements more concisely:

Crossed diplopia; an internal, or vertical rectus: with images on the same level; an internal rectus.

Vertical crossed diplopia; a vertical rectus. False image higher; superior of the opposite side. False image lower; inferior of the opposite side.

Homonomous diplopia; an external rectus, or an oblique: with images on the same level; an external rectus.

Vertical homonous diplopia; an oblique. False image higher; inferior of the same side. False image lower; superior of the same side.

TABLE.

Diplopia	Height of Images	Affected Muscle	Inclination of False Image
Crossed	On same level	Internal rectus	Outward, in the upper,* and inward in lower† nasal field
	False image higher	Superior rectus	Outward, in entire upper field
	False image lower	Inferior rectus	Inward, in entire lower field
Homonomous	On same level	External rectus	Outward, in upper,* and inward in lower† temporal field
	False image higher	Inferior oblique	Outward, in entire upper field
	False image lower	Superior oblique	Inward, in entire lower field

* False image slightly higher.

† False image slightly lower.

A pre-existing manifest esophoria may cause an homonomous diplopia in a paralysis of a vertical rectus muscle, and a pre-existing manifest exophoria may cause a crossed diplopia in a paralysis of an

oblique muscle. *The inclination of the false image, however, will enable one to differentiate.*

If the inclination of the false image is in a direction opposite to that which it should have, the muscle affected will be the associated elevator or depressor, as the case may be, of the same side.

We sometimes meet with cases of paralysis of the bulbar muscles which, owing to the impaired vision of the non-paralyzed eye, the patient fixes with the paralyzed eye, and it is the non-paralyzed eye that deviates. This condition may be detected by observing the primary and secondary deviations, and also from the fact that, in those portions of the field in which there is an inclination of the false image, *that image will belong to the paralyzed eye.*

274 West 72d Street, New York.

THE ANATOMY OF THE LARYNX AND TRACHEA.

PROFESSOR OTTO CHIARI.

Translated by Ross Hall Skillern, M. D.,

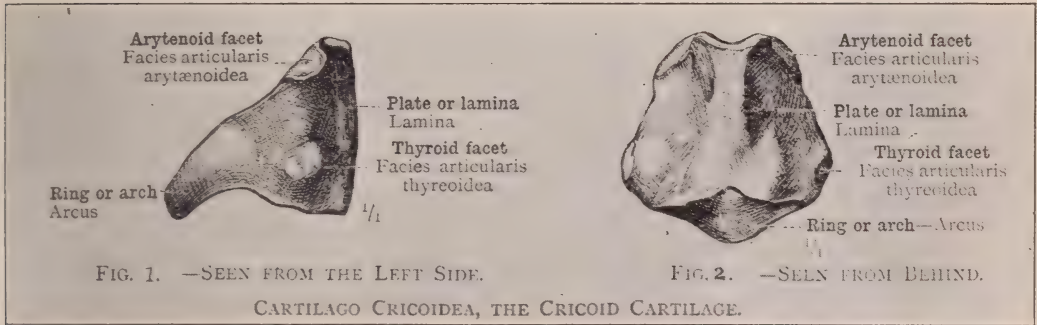
THE larynx forms the superior portion of the windpipe. In childhood, both in the male and female, it is of the same size, but at the time of puberty in the male it develops more quickly, and especially the superior portion of the thyroid cartilage forming a beak or protuberance (Adam's Apple or Prominentia laryngea). The voice box is situated in the lumen of the larynx and consists of two lip-like structures. These two vocal lips are able to widen and approximate through muscular action so that the larynx is enabled to carry out both its functions (respiratory and vocal). Furthermore, the esophagus lying immediately behind the larynx, the entrance to both being a common one (the pharynx) provision must be made to prevent the entrance of food into the air passages during the act of swallowing. In order to carry out these functions the formation of the larynx is somewhat complicated. For the sake of clarity the individual parts will be taken up in the following order. The cartilages, their ligamentous attachments to each other and neighboring structures, the muscles and the mucous membrane.

THE CARTILAGES.

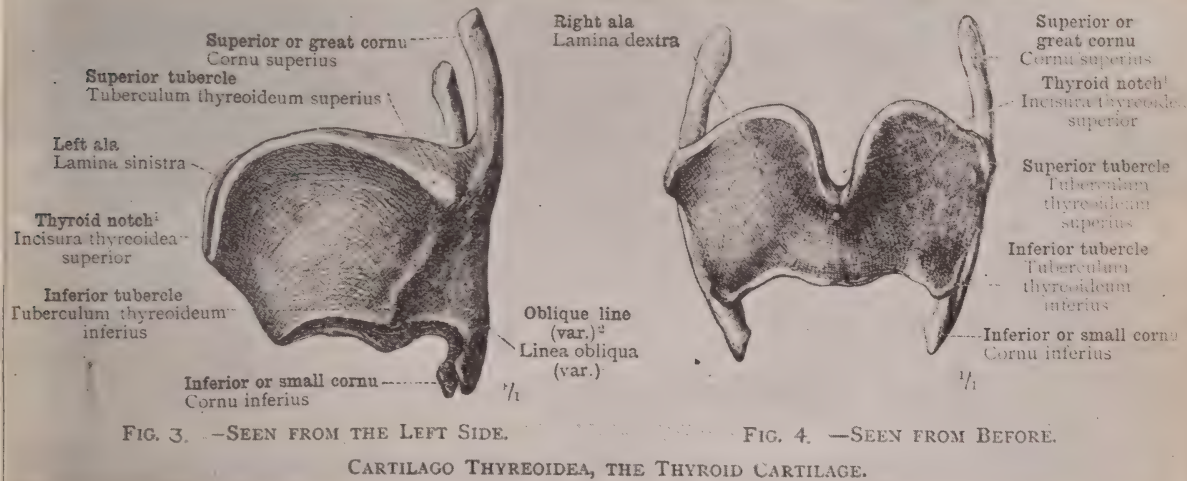
These consist of three single, the thyroid, the cricoid and the epiglottis, and one double, the arytenoids. Of less importance are the small cartilages, those called Santorini and Wrisberg.

The Cricoid Cartilage is formed entirely of hyaline cartilage and constitutes the base of the laryngeal structures. Its inferior edge lies horizontal when the head and throat is in the upright position. Its upper margin rises gradually from before backward, so that the height anteriorly is about 5mm., while posteriorly it is about 15mm. (See Fig. 1.) As a whole, this cartilage can be compared to a seal ring (Fig. 2). On the borders of the ring posteriorly are two round, flat articulating surfaces which serve for the articulation of the inferior horn of the thyroid cartilage. The posterior portion faces toward the pharynx and is divided into two flat fields by a median

ridge which serves for the attachment of the posterior crico-arytenoid muscle. On the superior surface one notes two elliptical articulating surfaces for the arytenoids.



The Thyroid cartilage, also of hyaline structure, consists of two symmetrical, vertical plates, forming a sharp angle at their junction anteriorly (Fig. 3). Both plates are almost square (Fig. 4). The



inferior edge is sharp and forms in the median line a small protuberance (inferior thyroid tubercle); behind this the inferior edge ends in the inferior horn, which articulates with the lateral surface of the arytenoid. Between the inferior edge of both plates and the ring of the cricoid the conical ligament is enclosed. The posterior edge of both plates are almost horizontal and terminate above in the superior and below in the inferior horns. The superior edge of both

plates descends anteriorly to form the superior thyroid incisure. In the male the edges form a beak (the laryngeal prominence). The angle which these plates form is sharp but varies according to the age and sex of the individual. On the inner side of this angle is situated a small, fibrous projection which serves for the insertion of the vocal cords. The inner surface of the plates is smooth and forms the external boundary of the pyriform recess. The external surface of the plates are divided by a ridge into two fields. The anterior being the larger gives insertion to the thyro-hyoid muscles while the posterior acts in the same capacity for the thyro-pharyngeal.

The Arytenoids. The cartilages represent a three-sided pyramid (Figs. 5, 6 and 7). Posteriorly at the base a protuberance is noted

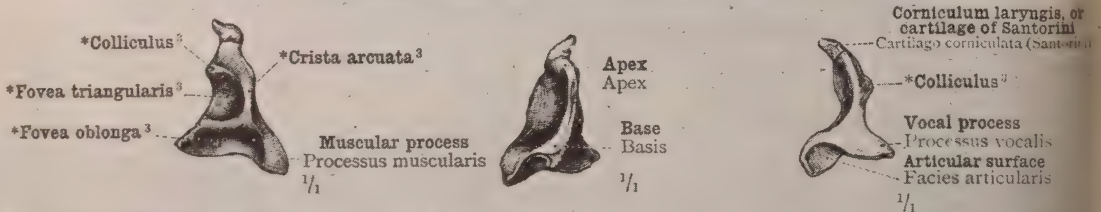


FIG. 5. —SEEN FROM THE OUTER SIDE. FIG. 6. —SEEN FROM BEHIND. FIG. 7. —SEEN FROM THE INNER SIDE.
 CARTILAGO ARYTENOIDEA SINISTRA, THE LEFT ARYTENOID CARTILAGE,³ WITH THE CORNICULUM LARYNGIS,
 OR CARTILAGE OF SANTORINI.

the muscular process to which the posterior crico-arytenoid and lateral muscles are attached. Toward the larynx, the base ends in a long somewhat sharp projection, the vocal process. On its outer surface the vocal muscle and the elastic fibres of the vocal cord are attached. Its medial surface is covered with mucosa. The point of the vocal process is visible through the mucosa as a yellow streak. On the inferior surface of the arytenoid, rather posteriorly, a long deep articulating surface is found which articulates with a corresponding surface on the cricoid cartilage. The posterior surface of the arytenoid is concave and serves for the insertion of the transverse arytenoid muscle. The apex of the arytenoid is obtuse and bent backward and on its summit lies the cartilage of Santorini. In the connective tissue which runs from the lateral edge of the epiglottis to the arytenoids (aryepiglottic fold) near the cartilage of Santorini is found the small cartilage of Wrisberg.

THE ANATOMY OF THE LARYNX AND TRACHEA.

The Epiglottis is a very flexible, elastic structure of cartilage, which contains many foramen and grooves, and toward the edges becomes sharper (Fig. 8). The epiglottis is rhomboid in shape, its inferior edges being longer and terminating in a point. That portion near the point is called the petiolus. Above this, on the posterior surface, is a thickening known as the tubercle of the epiglottis. That portion of the epiglottis situated above the lingual bone lies free in the pharynx (*pars pharyngeal*). The *pars pharyngea* shows various forms, sometimes straight, sometimes curved inward on itself taking on an omega form, thus preventing a view into the larynx. The epiglottis of children is almost always bent and raises itself but little during phonation and respiration. The inferior portion lying beneath the lingual bone is flat and runs to a point in an extension over

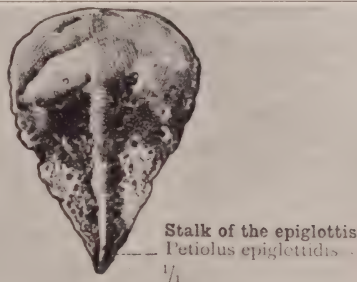


FIG. 8. —*CARTILAGO EPIGLOTTICA*, CARTILAGE OF THE EPIGLOTTIS. SEEN FROM BEHIND.

² See Appendix, note 23.

¹ Or *great median notch* of the thyroid cartilage.

³ See Appendix, note 26.

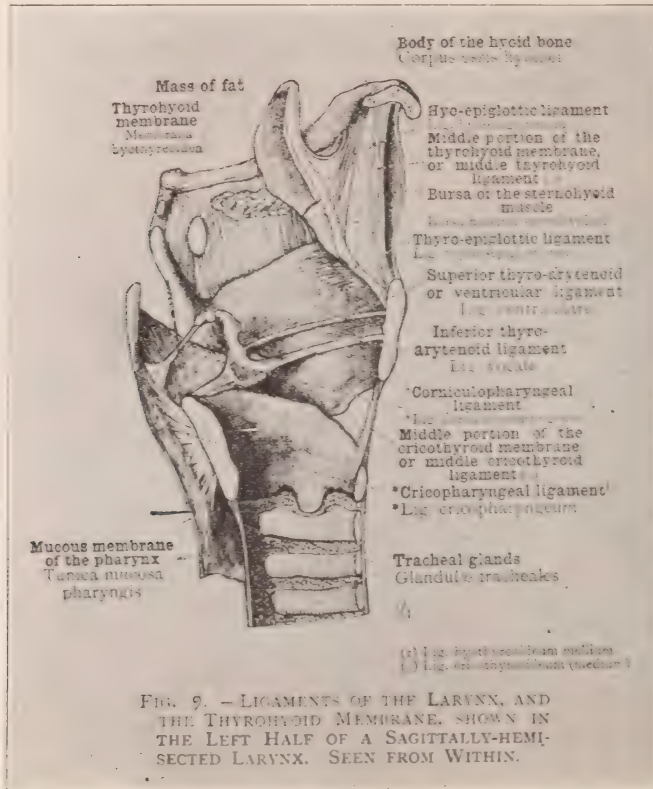
1 cm. long which inserts above the insertion vocal cords on the thyroid incisure.

The epiglottis is entirely covered with mucosa, except the anterior surface of the laryngeal part, which is separated from the throat by the hyo-epiglottic ligament and the hyo-thyroid membrane.

ARTICULATIONS OF THE CARTILAGES OF THE LARYNX.

The Crico-Arytenoid Articulation is formed by a long, slightly convex surface on the superior surface of the cricoid cartilage and the concave surface of the base of the arytenoid. The long axis of the two surfaces cross each other. The capsule of the joint is loose

being fortified by the posterior crico-arytenoid ligament which lies inside and posteriorly. This ligament prevents the motion of the arytenoid anteriorly and thereby assists in tightening of the vocal cords. The free motion of this articulation is markedly influenced by the muscles which insert on the arytenoid. The principal motions of this joint are to approximate and to open up the arytenoids or in the fashion of a luxation. By means of this luxation or turning the vocal



processes of both joints are symmetrical. The crico-thyroid articulation is formed by the inferior horn of the thyroid cartilage and the articulating facet on the outer surface of the cricoid plate. The principal motion of this double joint is in the frontal and horizontal, a rocking movement which approximates the ring of the cricoid to the inferior surface of the thyroid cartilage. The cricoid is the movable cartilage. When the anterior portion raises, the posterior part sinks. With this position the arytenoid must naturally follow in a backward

THE ANATOMY OF THE LARYNX AND TRACHEA.

direction and result in a tension on the vocal cords. When this movement occurs in the opposite direction the cords become relaxed.

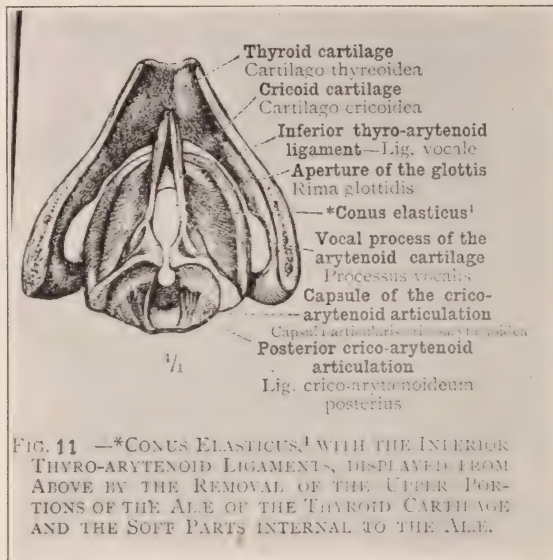
LIGAMENTS OF THE LARYNX.

The most important attachment between the cartilages themselves is the Conus elasticus. This consists of strong connective tissue richly interspersed with elastic fibres which spring from the superior edge



of the cricoid cartilage, the anterior edges of the arytenoids and from the external surfaces of the vocal processes. Its anterior fibres are very strong, being especially rich in elastic tissue, and are directed from below upward to the inferior edge of the thyroid cartilage, thus filling the space between the thyroid cartilage and the ring of the cricoid. This portion is called the medial crico-thyroid ligament or ligament conicum.

The lateral fibres extend to the inner surface of the thyroid cartilage and the superior fibres extend from the vocal processes horizontally to the middle or the angle formed by the junction of the two plates of the thyroid cartilages. The superior fibres are called the vocal ligament. They are the real vocal cords which form the ground work of the vocal bands. The conus elasticus (Fig. 11) represents a pyramid with the base below, while the apex forms the rim of the glottis. This conus elasticus is the most important con-



nective band of the larynx because it binds together the principal cartilages (cricoid thyroid and arytenoid). The ground-work of the ventricular bands (false cords) is the ventricular ligament (Fig. 9) which arises from the edges between the medial and lateral surfaces of the arytenoids and inserts in the angle above the attachment of the vocal ligament.

The inferior portion of the epiglottis is attached to the thyroid cartilage by means of a very elastic band over 1 cm. in length. Its insertion extends from the superior incision of the thyroid to the attachment of the ventricular bands (Fig. 10). In addition, the epiglottis is attached to the hyoid bone, the tongue, the arytenoids, and the pharynx by ligamentous bands. Through these it is held in the upright position and when forced backward quickly resumes its original position. The epiglottis is connected with the tongue by one

THE ANATOMY OF THE LARYNX AND TRACHEA.

medial and two lateral folds, the plica glosso-mediana and laterales. The plica aryepiglottica (aryepiglottic folds) run from the lateral edges of the laryngeal portion of the epiglottis to the arytenoid cartilages.

MUSCLES WHICH BIND THE LARYNX TO NEIGHBORING STRUCTURES.

These muscles hold the larynx in position and functionate during phonation and respiration as well as during the act of swallowing. They are the sterno-thyroid, thyro-hyoid, sterno-hyoid, stylo-pharyngens and the inferior constrictor of the pharynx.

INTRINSIC MUSCLES OF THE LARYNX.

These are required to perform three functions and therefore are divided into corresponding groups. The openers and closers of the glottis, the tensors of the vocal cord and those moving the epiglottis and closing the laryngeal vestibule.

1. Openers and Closers of the Glottis (Cords).

a. The sole opener of the cords is the posterior crico-arytenoid. This muscle draws the processus muscularis inward and posteriorly and thereby causes a turning of the bases of the arytenoids so that the vocal process is brought outward. They therefore open the glottis.

b. The closers of the glottis are the lateral crico-arytenoid, the thyro-arytenoids, the vocales and the transverse arytenoids. The lateral crico-arytenoid draws the muscular process forward whereby the vocal process is brought inward. It closes the glottis (Fig. 14). The thyro-arytenoid draws the muscular process and the whole arytenoid forward whereby the vocal processes approximate. It also closes the glottis.

The vocal muscles take the form of a three-sided prism and are attached to the vocal ligament, thus forming the vocal cord. These two muscles have for a purpose to bring together the free edges of the tensened cords, also to evenly distribute the tension as well as to form the cords according to the register. These muscles play a most important role in voice formation and are therefore named the vocal muscles.

The arytenoid muscles (transversus) draw the arytenoids together, thereby closing the pars intercartilaginæ rimæ glottis (interarytenoid) and closers of the glottis.

2. Tensors of the Cords. These are the two crico-thyroids which approximate the ring of the cricoid and the thyroid, thereby drawing the thyroid plate downward, thus indirectly acting as tensor to the cords.

INTERNAL DIVISIONS OF LARYNX.

These are divided into three.

1. The superior, which extends from the entrance of the larynx to the free edges of the ventricular bands and is called the vestibule of the larynx.

2. The middle, which extends from the ventricular bands to the free edges of the vocal cords and contains the ventricles of Morgagni.

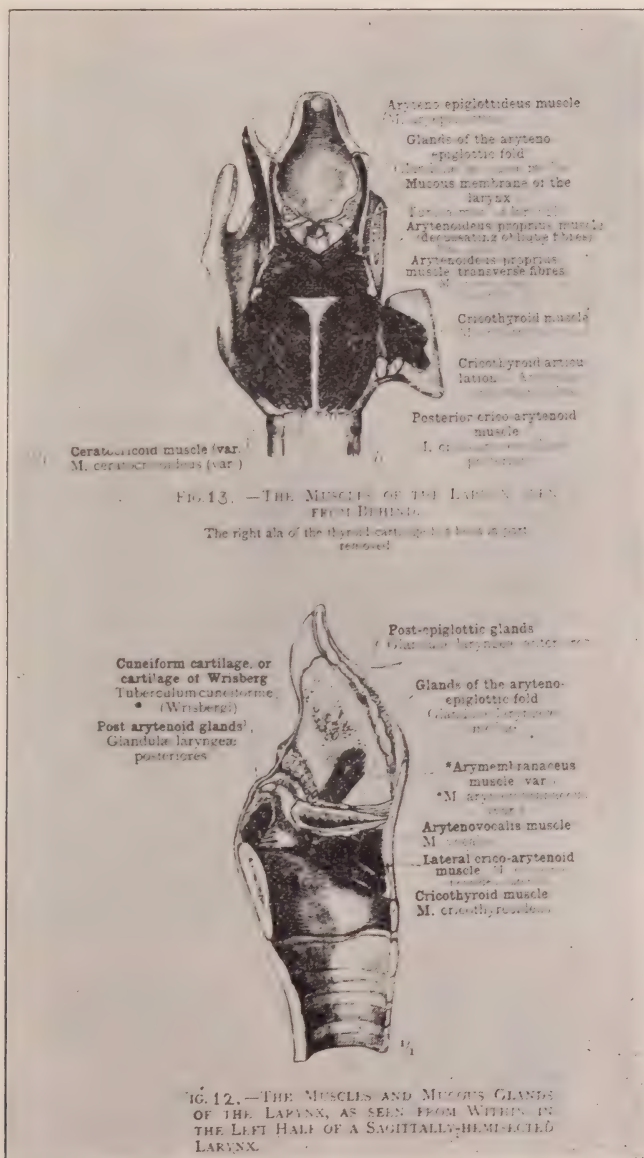
3. The inferior extends from the vocal cords to the inferior edge of the cricoid. The superior division. The vestibule of the pharynx is bounded in front by the epiglottis, laterally by both aryepiglottic folds and posteriorly by the arytenoids and interarytenoid commissure. The vestibule of the larynx extends downward and is able to close in the region of the ventricular bands. The fissure between these bands is called the rima vestibule or false glottis (Fig. 14).

The middle division. This contains both true and false cords and ventricles. The ventricles of Morgagni lie externally to the ventricular bands and open between the vocal cords and ventricular bands. The ventricle has a horizontal smooth floor which is formed by the upper surface of the vocal cord. The upper and inner wall is formed by the external surface of the ventricular band. The external lateral band consists of fat and connective tissue with numerous glands. The narrowest portion of the middle division is at the free edges of the vocal cords, these spring into the lumen and together with the processus vocalis form the rima glottidis. That portion between the vocal cords is known as the Pars intermembranacea rimæ glottidis, or glottis vocalis, while that portion between the vocal processes, the Pars intercartilaginea rimæ glottidis, or glottis respiratoria.

The vocal cords consist of the triangular prismatic muscle, whose upper horizontal surface forms the floor of the ventricle. The inner

THE ANATOMY OF THE LARYNX AND TRACHEA.

portion of this upper surface projects free into the lumen of the larynx. The lateral surface of the prism is attached to the inner laryngeal wall. The inferior surface is directed downward and inward, and loses itself in the lateral walls of the larynx (Fig. 14).



The free edge of the cord is covered by an elastic band, the true vocal band or *ligamentum vocale*.

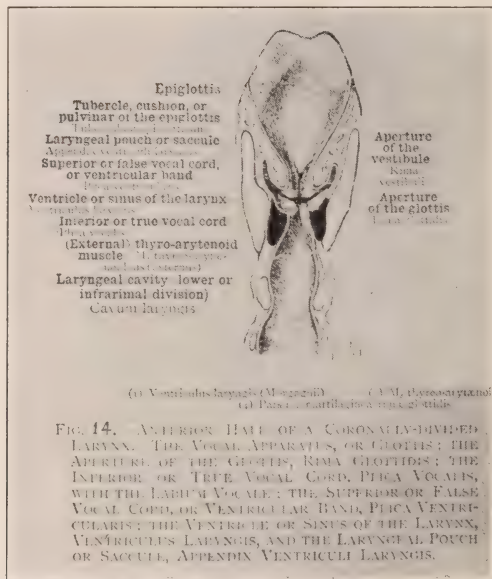
The inferior division extends from the edges of the cords to the beginning of the trachea.

SPACE BETWEEN BASE OF TONGUE AND EPIGLOTTIS.

This space is divided into two hollows by the plica glosso epiglottica media. These hollows are known as the vallecula. The mucosa is thin and loosely attached to the surface of the epiglottis.

Recessus pyriformis (Fig. 12).

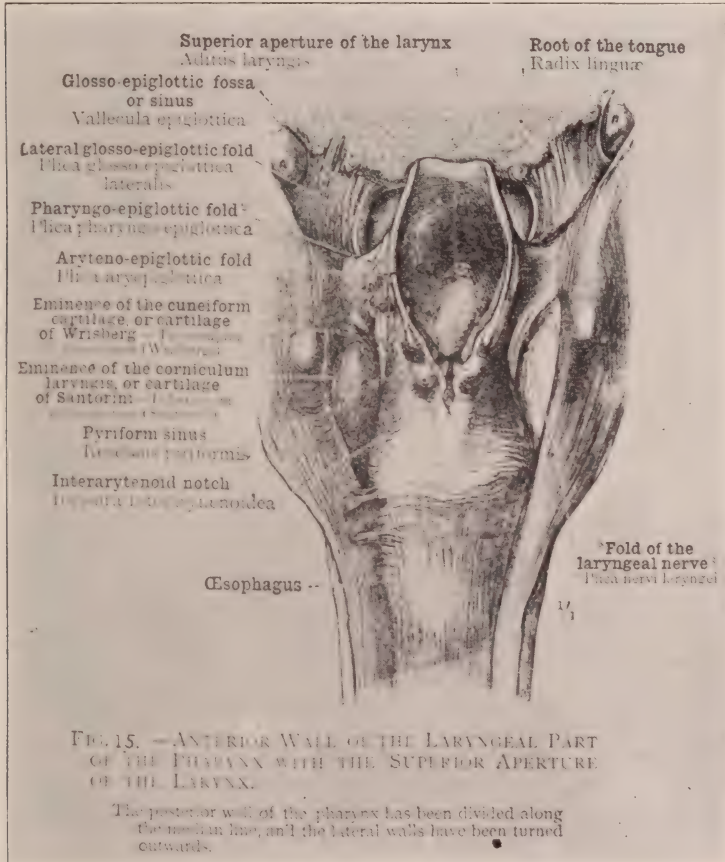
The plate of the thyroid deviates posteriorly some distance from the laryngeal tube, thus causing on each side a perpendicular fissure to be formed which becomes wider posteriorly and is known as the



recessus pyriformis. This recess is bounded internally by the edge of the epiglottis, aryepiglottic fold and arytenoid and a portion of the plate of the cricoid. Externally by the greater horn of the lingual bone, the hyo-thyroid membrane and the plate of the thyroid cartilage. Below, the recess becomes very narrow and leads into the esophagus. The posterior wall of the recess is formed by the posterior pharyngeal wall. The arytenoids project free into the lumen of the pharynx while beneath the plate of the cricoid lies closely against the posterior wall of the pharynx. Only during the passage of a bolus of food does this plate become lifted from the pharynx wall.

ANATOMY OF THE TRACHEA.

The Trachea extends from the inferior edge of the cricoid cartilage to the bifurcation. The cartilagenous rings cover only the anterior and lateral walls of the tracheal pipe. The posterior wall is composed of soft tissue, therefore the lumen of the trachea is not absolutely round but flattened posteriorly. The cartilagenous rings



are bound together by a membrane of connective tissue which is sunk below the level of the rings. Through the arrangement of the rings and the soft part the whole trachea is kept on a stretch, and open as well as giving it a certain degree of elasticity and mobility.

Its length varies between 11 and 15 cm. in the adult. The tracheal cartilages vary in number between 14 and 22. The membranous portion of the trachea consists principally of a fairly thick

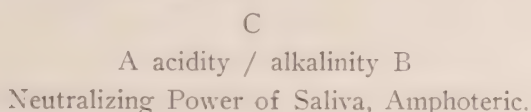
layer of transverse muscular fibres. External to this run a few horizontal fibres which are covered by the tracheal fascia. At the bifurcation the mucosa forms a ridge called the carina which lies usually to the left of the medial line.

Philadelphia.

ABSTRACTS.

The Neutralizing Power of Saliva and Dental Caries.—J. A. Marshall, *Amer. Jour. Physiol.*, Feb., 1910, XXXVI, p. 260.

In the past much of the work on the acidity and alkalinity of the saliva has been of a contradictory nature; conditions were such that the student did not know who or what to believe. Now comes a work bearing the marks of careful and thoughtful experimentation. Dr. Marshall shows the saliva to be constantly amphoteric, reacting to both acids and alkalies, and with a variability between the resting saliva and the activated saliva. He obtained the "activated" saliva by getting the subject to chew paraffin. The findings are interesting and well illustrated in the following diagram:



C is the variable point in the tests even with normal individuals; it may be found nearer A or nearer B, that is, in a given case the neutralizing power toward acids may be greater in amount than toward alkalies, or just the reverse. However, the summation of the two AC and CB is more constant for the individual. Activation causes a drop in the acidity and a rise in the alkalinity normally.

TABLE IX.—Paraffin Stimulus—absolute immunity (to caries) with care (of the teeth).

Case 66.

Normal Resting Saliva.

Activated Saliva.

c. c. n 200 H Cl	c. c. n/200 NaOH	Neutralizing Power	c. c. H Cl n/200	c. c. NaOH n/200	Neutralizing Power
14.60	17.10	31.70	43.02	0.80	72.3

The matter of selection of the color indexes appears important as the values of results from the different indexes vary. Marshall used for the alkalinity, Para nitrophenol, adding to this an excess of n/200 H Cl followed by careful neutralization with n/200 NH₄ OH until first yellow appears. The subtraction of the number of cc. in steps

2 and 3 gave the total $n/200$ H Cl used. The previous excess of H Cl being used to precipitate the mucin.

Phenolphthalein with $n/200$ NaOH was used for the acidity tests.

There was found no direct connection between the condition of the saliva at rest or activated that bore upon the subject of susceptibility to caries. Yet when the ratio, expressed in percentage, between the total neutralizing power of resting and activated saliva was compared, it was seen there was a wide difference between the patient with caries and one immune. This ratio Marshall called the salivary factor.

His conclusions are worthy of repetition.

Conclusions:

1. That the reaction of normal resting saliva is too variable to be a positive factor in indicating any of the following conditions:
 - a. Absolute immunity either with or without care.
 - b. Present immunity either with or without care.
 - c. Caries either with or without care.
2. That a method analogous to that employed by Henderson (19) in measuring the power of the blood to maintain neutrality is applicable to the determination of the same power shown by the activated saliva.
3. By means of this method a "salivary factor" may be evaluated, namely, the ratio of the neutralizing power of the "normal resting" and "activated" saliva, respectively, the magnitude of which appears to be indicative of immunity from caries or the reverse.
4. In persons who are either absolutely immune or for the present immune from caries the magnitude of this factor (expressed in percentage) varies between 43 and 80, while in persons whose teeth are carious this factor varies between 80 and 132.

D. M.

F. W. Fitzsimons reports from South Africa a novel and original treatment for Pyorrhea Alveolaris, citing a case that he cleared up after exhausting other known forms of treatment. The method he used was the ionic application of Zinc Chloride to the gums. The anode was put in contact with a cotton pad saturated with the solution, a current of two milliamperes being used for fifteen minutes. In beginning the treatments a 2 per cent. solution was used, which solution was later raised to saturated strength. The case completely cleared up in spite of its unfavorable outlook, for previously various mouth

ABSTRACTS.

washes, iodine solution, peroxide, and autogenous vaccines had been used to no avail.—*Lancet*, Oct. 16th, 1915.

Vedder, E. B.—*Bul. Manila Med. Soc.*, March, 1911, Emetin as a Germicide. The original work of Vedder in establishing a scientific basis for the previous imperical use of ipecac and emetin in amebiasis, is so thorough and important as to merit abstracting, even at this late date. In fact, much of the subsequent work, especially that of Sir Leonard Rogers, had its inspiration from this source.

Vedder, while working in the U. S. Army Medical Corps in the Phillipines, definitely determined that solutions of ipecac and emetin had strong amebicidal values. The organisms used were two varieties of ameba, one isolated from tap water, the other a human species. In the first series of experiments, dilutions of the fl. ext. of ipecac were used, and found effective in strength of 1:50,000 and high as 1:200,000, depending on the original quality of the ipecac. There was much variety in this value; one specimen which was amebicidal at 1:10,000 contained only .855 gms. total alkaloid per 100 c.c. (the U. S. Pharmacopea calls for 1.75 gms.).

The samples used were analyzed by J. Rosario, of the U. S. Bureau of Sciences; the weakest preparation was amebicidal at 1:10,000, the strongest at 1:100,000. Species of paramoecia and balantidium coli were killed with ipecac 1:50,000, emetin 1:100,000. (From a clinical point of view in cases of bacillary dysentery the value of ipecac and emetin does not show up.)

"It is probable that the power of any given specimen of ipecac to kill ameba is directly dependent upon the proportion of emetin contained, though we cannot prove this at present owing to the fact that there is another alkali present, cephalin. However, from certain proofs it is probable that cephalin plays no germicidal role."

D. M.

The Bactericidal and Potozoacidal Activity of Emetin Hydrochloride in Vivo and in Vitro.—J. A. Kolmer-Allen J. Smith, *Jour. Infect. Dis.*, XVIII, 111, March, 1916.

There has just appeared, to supplement Vedder's work, an exhaustive study of the bactericidal and protozoacidal activity of emetin. The experiments were carried out on rabbits, rats and mice inoculated with different bacteria and trypanisomes. The conclusions which fol-

low definitely, establish the relatively low bactericidal value of emetin; this fact is of much negative value clinically and explains an interesting phenomenon seen in the treatment of many cases of pyorrhea. With the use of emetin on a given case there may be seen marked improvement *up to a certain point*, where the condition becomes stationary; from here it will be noted that the application of mild germicides will finally clear up the condition. The emetin had cleared up the amebic end of the infection, while the germicide finished up with the elimination of the bacteria.

The experiments further covered the action of emetin on two strains of trypanosomes, in which work it was found that *in vivo* and *in vitro* the salt is quite active, that the drug is most distinctive in its action on ameba and is borne out chiefly by the disappearance of the organism after administration of the remedy; the experiments *in vitro* are unsatisfactory and unconvincing.

Emetin hydrochlorid administered intravenously to rabbits in doses varying from 0.065 to 0.52 gm. (1 to 8 grains) per 132 pounds of body-weight exerted slight or no antiseptic or germicidal influence on a virulent culture of staphylococcus aureus; abscesses developed in the internal organs of the majority of experimental animals.

Emetin hydrochlorid administered intraperitoneally to mice in doses varying from 0.065 to 0.52 gm. and 0.975 gm. (1 to 8 and 15 grains) per 132 pounds of body-weight exerted no appreciable inhibitory or germicidal action on anthrax and tetanus bacilli.

Emetin hydrochlorid administered intravenously to white rats, infected twenty-four hours previously by intraperitoneal injection with *T. equiperdum* and *T. lewisi*, in doses varying from 0.065 to 0.78 gm. (1 to 12 grains) per 132 pounds of body-weight, appeared to exert a slight trypanocidal influence, which was most apparent in the experiments with *T. equiperdum*.

Emetin hydrochlorid is highly and specifically amebacidal *in vivo*, and its curative effects in ameba infections is to be attributed practically solely to this action. While the drug has slight bactericidal powers *in vitro* under the conditions of prolonged contact with micro-organisms, and while this germicidal action may enhance the value of emetin in the treatment of amebic infections by local application, in the light of our experiments this bactericidal action is not in evidence *in vivo*.

These observations constitute additional evidence of the active role

played by *Endamoeba gingivalis*, Gros, in the pathogenesis of pyorrhea alveolaris; improvement or cure of this disease with emetin by subcutaneous injection is to be attributed solely to its amebacidal action. In the treatment with local applications of the drug the beneficial results are to be ascribed in most part to this same influence, although here there is reason to believe that the beneficial effects are, to some degree at least, due to a coincident bactericidal influence on the part of the drug.

De la Chirurgie oculaire dans les ambulances de l'avant au cours de la première année de la guerre. (Aout, 1914-Juillet, 1915.) Dr. de Saint Martin.

A long and interesting article based upon cases received from the regimental relief stations or direct from the trenches within a few hours after the wounding or onset of the disease. His conclusions are:

1. The number of eye cases in the campaign are relatively small—3.63 per cent.
2. The medical cases were, almost exclusively, "banales" or benign conjunctivitis. Of 142 cases 125 were conjunctivitis.
3. The gravest and most numerous surgical cases were penetrating wounds of the globe (41 per cent. of ocular injuries).
4. Prognosis of the last named is made worse by the frequent complication of an intra-ocular foreign body; enucleation is necessary, sooner or later, in almost all these cases.
5. To improve this prognosis somewhat there should be a previous examination of the patient at the ambulance by an oculist with an electro-magnet and radiographic installation.

Only thrice did head wounds cause visual trouble; this was amblyopia, which in two was transient—observation of the other was interrupted. These two cases were shell wounds of the occiput: slight depression of the outer table of the occipital bone a centimeter above the occipital bos, and double penetrating wound, right and left, of the occipital region with escape of brain substance.

Asphyxiating bombs exploding two or three hundred meters away caused: a tingling ("picotement") in the eyes, slight, then intense, with lachrimation and photophobia, burning and conjunctival injection. With some persons there was also dryness of the throat or even indications of asphyxia. Irrigation ("lavages") with borated solution of zinc sul-

phate afforded sensible relief to most. This gas, called "lacrymogenes," consists for the major part of bromide of "benzile."

In 508 head wounds, mostly grave cranial lesions, Dr. de St. Martin did not observe a single *recent* alteration of the deep ocular tissues in which there was not direct connection with the injury. Nor has he come across a single case of ocular lesion, without wound, consecutive to a violent commotion or to air concussion from near explosion of large projectiles.

Les Astigmates a l'Armee.—Dr. L. Weekers (*Annales l'Oculistique*, Jan., 1916). The visual acuity required of Belgian soldiers since the war, is like that of the French: it should be at least equal to 0.5 for one eye and to 0.2 for the other. Astigmatism is very frequent. It is not practicable to send to the rear for their glasses to be replaced, but Dr. Weekers has found it practicable to give them satisfactory glasses by carrying strong mountings of good quality for round glasses and the following restricted assortment of round lenses, the cylinders having the axis marked with a diamond. He has not found it necessary to correct astigmatism to a quarter diopter, and notes that in compound astigmatism the cylindrical correction is less important when the hyperopia or myopia is of high degree. Experience has shown him that with a stock of 45 types of cylindric and sphero-cylindric glasses he can on the field give entire satisfaction to the astigmatic soldiers.

His collection consists of:

Cylinders, + and — : 1., 1.5, 2. and 3. D.

H. + Ah.: 1., 1.5, 2. and 3. c \bigcirc + 1., 2. and 3 sph.

M. + Am.: — 1., 1.5, 2. and 3 c \bigcirc — 1., 2., 3. and 4. sph.

Mixed As.—2c \bigcirc + 1. s — 3. c \bigcirc + 1. s — 4. c \bigcirc + 1. s.

—3c \bigcirc + 2. s — 4. c \bigcirc + 2. s — 5. c \bigcirc + 2. s.

—4c \bigcirc + 3. s — 5. c \bigcirc + 3. s — 6. 3 \bigcirc + 3. s.

The doctor determines the astigmatism with an ophthalmometer (as more practicable than skiascopy), illuminated with electricity; it is not an encumbrance, can be quickly packed with a special chest and transported out of danger or to another location.

In the Belgian army to the ambulance corps of each division is attached either an eye specialist or a physician with ophthalmic knowledge such as exinternes who have had an ophthalmological service.

With instruments and test glasses these look after the ordinary cases; when necessary they send the soldier to the specialist who has the above stock of glasses, or, if that is not practicable, communicate with him by telephone and receive the appropriate glasses the same day.

It is astonishing, adds Weekers, how many soldiers go through a campaign, or part of a campaign, with but half or a third or less of normal vision and fill positions, such as sentinel, scout, etc., which readily call for acute sight. He recommends that at the time of enlistment or enrollment vision should be tested, recorded and improved by glasses. It is more convenient to do this in time of peace or in camps of instruction; the military efficiency of many would be thus much increased.

J. L. M.

Des Operations Inopportunes.—E. Valude (*Ann. l'Ocul.*, Mars, 1916) protests against operating soldiers in military hospitals for monocular cataract or for strabismus because no advantage from a military standpoint is gained. A civilian seeks the surgeon and accepts the risks of an operation after hearing of them and of the prospects of benefit; but the soldier is entirely passive—he is sent to the hospital to be rehabilitated for services so far as possible. A case is detailed of blindness because of post-operative sympathetic ophthalmia and one of incapacitating diplopia brought on by operating for strabismus.

J. L. M.

Infectiones Comeennes a diplobacilles.—Note sur deux diplobacilles non encore décrits (*bacillus duplex nonliquefaciens* et *bacillus duplex Josefi*). Scarlett (*Ann. l'Ocul.*, Mars, 1916) describes these two new diplobacilli, reports his bacterial studies of them, and two cases of corneal ulceration which they had caused.

Cultures on *coagulated serum* of: I, *Diplobacillus* of Morax, + with liquefaction; D. B., of Petit, liquefaciens, +, with liquefaction; III, D. B. Non-liquefaciens (N. S. Scarlett), +, without liquefaction; IV, D. B. Josephi (N. S. Chaillons), feebly +, without liquefaction.

On *gelatine*: I, negative; II, positive and liquefaction; III, +, without liquefaction; IV, negative.

On *ordinary gelose*: I, negative; II, positive; III, positive; IV, positive.

On "*gelose Ascite*:" I, +; II, +; III, +; IV, +.

On "*gelose Ascite*" at room temperature: I, —; II, +; III, +; IV, ?.

On *potato*: I, —; II, feebly +; III, —; IV, —.

On *ordinary bouillon*: I, feebly +; II, feebly +; III, +; IV, +.

Coloring with Gram: I, —; II, —; III, —; IV, +.

The diplobacillus non-liquefaciens caused a serious and painful ulcerative keratitis with hypopion which did not cicatrize until after a month and then with almost complete loss of vision in the eye affected. The infection developed in a patient with history of disease of the lacrimal passage but still preserving a little lacrimation.

The diplobacillus Josephi caused a relatively benign secondary infection of the cornea with slight infiltration and hypopion in a tubercular patient with corneal herpes. This infection was completely corrected in less than fifteen days after its appearance.

J. L. M.

L'hemiaopsie par contusion In crane.—Hemianopsia from penetrating wounds is extremely frequent in this war. It is not easy to establish the efficacy for the hemianopsia of surgical intervention because of the paucity of subsequent histories.

In cases of hemianopsia or complete blindness following non-penetrating wounds of the occipital region, it is difficult for the oculist to advise the surgeon as to decompressive intervention because the treatises, and even very complete monographs shed very little light and furnish but very rare cases which are with difficulty likened to the case under consideration.

V. Morax (*Ann. l'Ocul.*, Mar, 1916) in two cases which he reports considered intervention not justified, because he does not think that decompressive trephining would affect the sanguineous infiltration of the cellular and fibrous nerve substance, even granting its modification of local conditions by removal of subdural blood clot and lowering of hypertension of the cephalorachidian fluid. He would prefer waiting unless there was clear indication for surgical intervention. (How much more assured would be his position if he knew what arnica, hypericum, etc. could do for such cases.)

J. L. M.

Penetrating Wounds of the Orbit Which Injure the Eye.—A French military oculist (*Ann. d' Ocul.*, Jan.) classes such cases as cranial. His paper discusses prompt and inevitable enucleation and the care of various injuries, but justice cannot be done in a brief abstract.

The doctor extracted a bit of stone from the iris and obtained a definite cure: the wound dated from the night before: a few hours' delay would have met a purulent iritis. His treatment proved successful, to complete cicatrization, of 8 superficial injuries of the cornea, some of which were complicated with sharp inflammation, hypopion and iritis, and 7 burns of cornea or conjunctiva due to deflagration of bombs or grenades: it also secured rapid and normal evolution in some cases of contusion of the globe with deep lesions, such as: hæmorrhage of retina or vitreous, internal ophthalmoplegia and traumatic cataract. He is convinced of the necessity for an oculist with the ambulance at the front, so as to secure early diagnosis and treatment of eye cases, and also of the desirability of a radiographic outfit.

Eight times he performed enucleation rather than exenteration for antero-posterior penetration of a small body travelling with great force, considering that the chances were equal for finding the foreign body in the eye ball or in the orbit. As a matter of fact, he found the foreign body within the eye only twice. Once his exploring finger detected the bit of shell in the orbital tissues behind the globe. —J. L. M.

Meniere's Disease.—Oliver Tydings, (*J. of O. and O.-L.*, May). Meniere, in 1861, believed he was dealing with an entity when he associated vertigo, nausea, vomiting and absolute deafness with the condition where postmortem examination shows hæmorrhage or bloody extravasation into the semicircular canals and vestibule. Since his day many authors have wished to include under that name all cases of disturbed equilibrium, vomiting and deafness, and have thus caused regrettable confusion.

One must not confound Meniere's syndrome, which is found in a great number of aural affections, with Meniere's Disease, characterized anatomically by a primary or secondary lesion of the labyrinth and clinically by the above syndrome.

The term Meniere's Disease, says Keresion, may be properly applied only to the condition in which pronounced deafness and other phenomena of vestibular irritation occur suddenly as a result of hæmorrhage into the labyrinth. In its true form it is unquestionably one of the rarest of lesions. As a pathological entity it must be remembered that many conditions which we now know to be capable of inducing identically the same clinical phenomena were practically unrecognized until a comparatively recent date.

Affections of the middle ear or Eustachian tube will at times induce symptoms complex which have been grouped under the name Meniere's Disease. In one such case, some 18 years ago, there had been two attacks of syncope, vertigo, tinnitus, vomiting and temporary deafness; the diagnosis of Meniere's Disease was made by a specialist above the average in ability, and yet under proper treatment directed to the auditory apparatus Eustachian tube and gastro-intestinal tract, the patient made a complete and permanent recovery.

Leukæmia, syphilis, anæmia, the grip and diseases of the central nervous system may all give rise to this syndrome. And many cases have been reported of bloody exudates where no Meniere's symptoms were noticed during life.

We may have a hæmorrhage within the labyrinth, as shown post-mortem, without one of the symptoms of Meniere's Disease, and upon the other hand we may have other cases with Meniere's symptoms clearly due to other causes than hæmorrhage onto the labyrinth—disease of the central nervous system, autointoxication from gastro-intestinal disorders, toxæmias from specific infections—inherited or acquired—besides many other conditions. We often meet cases with manifestations which, from accepted text books' teachings, could be classed as case of Meniere's Disease, a diagnosis which to an intelligent man causes more or less concern for his future well-being, and for that reason Tydings urges more care in the consideration of these cases.

Six cases are reported.—J. L. M.

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Editorial

THE CONCRETE IN PROFESSIONAL CONVENTIONS.

WHEN pedagogy discovered that the child could more easily, quickly and accurately learn to spell BOX, when he was shown one and was allowed to take it apart and put it together again, and thus weld together forever in his memory the thing with the word BOX, teaching as a profession leaped forward a century.

The old-time debating societies forever settled in the affirmative the question, "Resolved, that One can Learn more by Travel than by Reading;" we are not all from Missouri but we want to be shown.

The object lesson for the child is no more valuable as an educational measure than is the surgical clinic for the surgeon. Dr. Wm. H. Phillips, the retiring president of the O., O. and L., knew this perfectly well when he broke all precedents in devoting two full days or one-half of the 1916 Annual Convention of that society to a surgical clinic. The excellent judgment which he displayed in this was only excelled by his selection of the place for the clinic. Not only did he believe that our great metropolis, with its limitless clinical material and hospital facilities, was the place, but he was confident that the New York members of the society were equal to the task of making the clinic a success befitting such an undertaking. How well they succeeded, only those who witnessed it can know, again proving the superiority of the concrete over the abstract. Those members whose knowledge of this epoch-making clinic must be obtained only by reading its reports cannot realize the magnitude of it. Think of one hundred and one operations performed in one hospital in two days, all in the eye, ear, nose and throat fields; nine-tenths of them under general anæsthetics, and not a single fatality. It is yet too early to report finally

on the end results, but the writer was informed ten days later that there had not been a single case gone wrong in any way. No hemorrhages in 39 tonsillectomies, no infections anywhere. There have been clinics and clinics, but none like this. The plan of the committee in charge to exhibit the various operations and technique was admirably carried out. So we saw tonsillectomies done in a half dozen different ways. The intra- and extra-capsular cataract extractions. Glaucoma relieved by iridectomy, corneo-scleral trephine and cyclodialysis. Eye muscles tucked, looped, advanced, and tenotomized. The various mastoidectomies. Septal deformities corrected by various methods, and so on. Then, too, the anæsthetists showed that they could put their patients to sleep in no less than eight different ways; rectal anæsthesia, intra-venous anæsthesia and nitrous oxide and oxygen being among the newer methods. Fourteen operations were performed in two other hospitals, making 115 in all.

For some reason the scientific papers and discussions which filled the succeeding two days in Baltimore seemed unusually brilliant and satisfying. No doubt the shorter program added zeal and enthusiasm. In addition there were numerous and elaborate social features, in both New York and Baltimore, which altogether rounded out the twenty-ninth annual meeting of the O., O. and L. into perfect form. May it long live in pleasant memory of its participants.

I. O. D.

THE PRACTICAL ERA.

Time was, not so many decades past, when the medical man posed *as* a superior being little removed from the atmosphere in which the medicine man and snake charmer of savagery moved. His austere bearing and heavy flowing whiskers served as it were as a mystery screen withholding from the vision of the curious layman much that he desired to know and much that he was entitled to know. However, had the screen been suddenly torn aside we can well imagine the utter astonishment with which the said layman must have gazed at the large percentage of empty shelves in the vault of medical knowledge.

A great change has taken place. Two things stand out prominently in the improved condition of to-day. First, the layman has all but pulled the screen aside, and second, the shelves are more nearly

filled; and whether it is altogether pleasant or not for us to admit, nevertheless it is true that the first factor was in a large degree causative of the second. The layman *would* see in, and professional pride demanded that there should be a creditable display on exhibition.

In other words, medicine is losing its illusions and getting down to brass tacks. We want to know. We must know! Nowhere in all the field of scientific endeavor do we find more earnest, diligent and persistent seeking for definite, exact knowledge than in medicine and surgery. And we find that the more established that knowledge becomes, the more willing, and we may say anxious, we are to impart it to our fellowmen; that its possession may aid him to live right, and keep well. That it may preserve the health and lives of his little ones and thus prolong the breaking of family ties. Columns appear daily in the public press teaching the people how to avoid sickness and death. The bars are down. The screen has been ruthlessly torn away. There is now no corner or monopoly on the knowledge which makes for health and happiness in the great human family. It is the twentieth century era of the brotherhood of man.

I. O. D.

NOTICE.

In this issue of the JOURNAL will be found the transactions of the twenty-ninth session of the O., O. and L. Society. This report is complete to the end of the business session of the 1916 meeting which was held in Baltimore. The two days' clinical session in New York City preceded the scientific and business session in Baltimore and will be reported later.

A complete resumé in the form of individual case reports the committee will compile and publish later giving end results of the surgical treatment of 115 cases.

Attention of the members is called to that part of the business session which decreed that no transactions or binders for journals will be furnished by the Society, and, therefore, it is important to preserve the present number as the only published record of the 1916 meeting.

The secretary also desires to announce that he is preparing for publication in the JOURNAL a revised list of active membership in the Society.

The members may materially aid in the accuracy of this by referring to their own names and others of their acquaintance in the list of members recently mailed, and advising the secretary at once of any errors in addresses or otherwise which they may detect.

IRA O. DENMAN.

CORRECTION.

By an error we regret omission of acknowledgment in our last issue of the courtesy extended to us by *The Journal of Parasitology* for the cut in Dr. Macfarlan's article on "Amebæ."

ADVERTISING.

It is an old axiom but a true one, that everything has the elements of existence or destruction wrapped up within itself, and though a wicked thing may grow and flourish like the biblical bay tree, its evil in time will destroy it. How true this is of the advertising era that is about to pass away.

The Associated Advertising Clubs of the world met in Philadelphia this summer in their annual convention and gave to the world with renewed vigor their slogan of "TRUTH" in advertising. All the press reports, their banners, their transparencies in the pageant, even their official seal, reiterated their purpose.

How must this endeavor strike the medical profession? We have long borne the burden of the fakir in advertising and not only have suffered a loss of pocket from the patent medicine man, but have with ignominy witnessed the perversion of the "weak-brothers" who have fallen into the use of nostrums.

But we now believe that a new era is at hand, intelligence and honesty are on the ascendency, and the old days are gone. There still remains, however, a certain effort by the unscrupulous to catch the eye and the wits of the less wily. The effort is usually cloaked under the appearance of a scientific presentation, the remedy is no longer a "secret" nor a "cure-all," but the public and the profession are generously "let in." A host of testimonials from supposed reputable physicians, or a series of cases is presented showing in a striking way the benefits from the use of the remedy. The large pharmaceutical houses are usually the offenders and try to put out and get into use

a line of special remedies with the same old idea of proprietary names. It is easy for the slovenly professional man to pick up these remedies with their printed indications and apply them to a given case. It requires little mentality,—but does the prescriber know what he is doing? Has he none of the known remedies at his call—remedies that have been used for generations? With what familiarity does he use the newly accepted remedies,—how readily, for instance, will he use the stock vaccine without a knowledge or consideration of the factors involved.

The appeal to honesty and conscientiousness still stands and cannot be better apostrophied than in the words of the immortal bard:—

“First of all to thine own self be true
And it must follow as the night the day, thou canst not then be false
to any man.”

D. M.

THE SCIENTIFIC AND BUSINESS SESSION OF THE
TWENTY-NINTH ANNUAL MEETING OF THE
AMERICAN HOMEOPATHIC OPHTHALMOLOGI-
CAL, OTOLOGICAL AND LARYNGOLOGICAL
SOCIETY HELD AT THE HOTEL EMERSON,
BALTIMORE, MARYLAND, ON JUNE 26TH AND
27TH, 1916.

MONDAY, JUNE 26TH, 1916.

FIRST SESSION, 9:30 A. M.

The first session was called to order at 9:30 A. M. by the President William H. Phillips.

C. G. Fellows moved that the program as printed be adopted as the order of business with the exception that papers whose authors were absent be read by title only, until the end of program when they could be read if so desired.

Seconded. Carried.

The President appointed the following committees:

(a) Attendance, Fred D. Lewis, Neil Bentley.

(b) Nomination. The former presidents of the society in attendance at this meeting become the nominating committee by virtue of the by-laws.

(c) The Press, C. L. Rumsey, T. L. Shearer.

PRESIDENT: The next order of business is the president's address.

C. G. FELLOWS: This is so important a part of the program that we ought to have as large a number present as possible, and, therefore, I move that the president's address be postponed until some later date to be called up at the discretion of the president. Seconded. Carried.

PRESIDENT: Then we will go on with the program, and this takes us to the scientific part. Is Dr. Lewis present? Then we will have the first paper on the program.

A UNIQUE EYE INJURY.*

FRED. D. LEWIS, M. D.

IN presenting this paper to this society to-day I have two objects in view.

First: The injury is one that stands alone in its nature in my experience of twenty-four years of eye practice, and my brother, Dr. F. Park Lewis, whom I had in consultation, told me he had not had a similar case in his practice, which is sixteen years longer than my own. Therefore, I think the case should go on record, also we should learn a lesson in the care and thoroughness to be used in future cases.

Second: The treatment of this case gives me an opportunity to present what I believe to be some original work in the treatment of a very frequent form of trouble presented to us, which if taken up by the individual members of the society in their private practice for a year, and the results obtained reported, may be of untold value in the future treatment of these patients.

The case was a young man of twenty-four years of age, who worked in an iron works where iron was wrought into ornamental designs. He was of Polish nationality and spoke practically no English. He was brought to my office early in the morning of December 22, 1915, by a fellow workman who acted as interpreter.

The left eye had just been injured showing a piercing of the lower portion of the cornea and iris, distorted pupil and rupture of the capsule of the lens, so that the anterior chamber was filled with lens matter. The foreign body could not be seen, so it was a question of whether it had penetrated the eye, or if it had been a large piece which had cut the eye and rebounded.

The patient was sent at once to the hospital, atropine instilled and cold applications applied. Inflammation was not severe, and on the 24th, two days after the accident, an X-ray picture was taken. The first picture showed the metal, a goodly sized piece, imbedded in the ciliary region and also a piece that seemed to be in the brain. As there were absolutely no brain symptoms other pictures at various angles showed this second piece to be on the side of the head under the scalp.

*Read at Meeting of Amer. Hom. O., O. and L. Soc., Baltimore, June 26th, 1916.

Later questioning of the patient explained this: He said he had been in this country three years, and three years before leaving Poland he had been struck on the side of the head with a piece of iron or steel. The iron from the ciliary region was removed with the giant magnet, and all went well until January 8th when patient complained of decided loss of vision in the right eye. There was nothing characteristic of sympathetic inflammation, but the fundus could not be plainly seen as there was decided haziness of the lens. As the left eye was injured beyond any possible hope of sight, and as I thought it might possibly be having some effect on the right, on January 15th I enucleated the left globe. I had atropine instilled into right eye and then discovered an adhesion of the iris, lower border to lens capsule, also mark on cornea as if it might be from old injury. An X-ray was taken of this eye showing a minute bit of metal in central lower portion of the globe. The conjunctiva was dissected back, an opening made through sclera and the giant magnet applied but not successfully. Repair took place kindly and atropine continued, but adhesion was so well established that it did not break. By this time traumatic cataract was well advanced and vision was fingers at three feet.

The unique feature of this case is that absolutely no complaint of the right eye had been made until vision was decidedly impaired, no marked inflammation was present, and yet both eyes had been perforated at the same time. Of course the injury to the left being of so much greater extent as to detract attention from the right. Also there was no injury to the face, not a mark on cheeks, nose or brow, so the two pieces alone had reached him, one going directly to and into each eye.

Now as to the second object in presenting this paper, and by far the most important, I will have to start at the beginning. Several years ago I had a patient coming from a section of the country where was located an Indian reservation. On examination the eyes showed best vision to be obtained with careful refraction to be less than half. The ophthalmoscope showed cataracts, and I prescribed glasses, advising as was my custom patient waiting until one or the other of the lens was ripe for operating. About two years later the patient returned with vision almost perfect and scarcely a trace of spiculæ on edges of lens. Questioning revealed the fact that a remedy advised by an old Indian had been used, namely, the dropping into each eye of

wild honey, or if the wild honey could not be had, of buckwheat honey. This my patient had done and the lens were certainly very much cleared up.

A short time after this case reported to me I saw an item in a daily paper reporting that in California a man who had been practically blind for some years, while trying to get around a farmyard had knocked over a hive of bees and was severely stung. So badly was he injured that he was confined to bed for several days, and greatly to his surprise and the surprise of his friends, when he recovered he also regained his sight. I could think of no condition of long standing that might be helped by the bee poison unless it were cataracts. I thought any way that *Apis mel.* would be worth trying in my cases of cataract that were not ready for the knife. Further, I concluded that the remedy should be given internally, and perhaps the case treated by dropping honey into the eyes might have been helped by the absorption of a small amount of *Apis mel.* that might be in the honey. I started by using the 1x dilution on discs, having patients take a dose before meals and at bedtime. Some of the results have fully borne out my deductions.

To cite but one case where careful refraction gave me 20/70ths vision, and cataracts quite evident, *Apis mel.* 1x was prescribed, four doses daily. This case reported in one month with vision 20/30ths. Medicine for another month given and case is still under observation. Many cases have apparently been held from advancing and some entirely cleared up, although few as quickly as the case reported.

Now to again refer to the injury which is the subject of this paper. When the patient left the hospital the vision of the right eye was fingers at three feet. He was kept on *Apis mel.* 1x for a month, reporting at my office each week. I could see some clearing of the lens, and on February 16th his vision was fingers at six feet. A month later his vision was fingers at ten feet, when I increased the *Apis mel.* to drop doses of the tincture four times daily, and will, I expect, gradually increase it. If the internal administration of a remedy will clear up a traumatic cataract, and this remedy has without doubt cleared up or held in check many cases of ordinary cataract in my experience with it in the last two or three years, then I think the time has been well spent in the preparation and presentation of this paper.

I would very much like it if every man present would constitute

himself a committee of one to give this method of treatment a try out, keeping records of cases and results, and reporting his experience with it at our meeting a year from now.

DISCUSSION.

DR. JAMES A. CAMPBELL: In the first part of Dr. Lewis' interesting paper, two points for remark occur to me. The right eye gave no evidence of involvement until over two weeks after the injury of the left eye. Then the vision of the right eye was affected and a posterior synechia was discovered. An X-ray examination then revealed a small foreign body in the central lower part of the eyeball. Is it not possible that this foreign body in the right eye was, perhaps, of long standing, as the piece of iron in the scalp was, remaining in a quiescent state until aroused into activity by the sympathetic irritation from the injury of the other eye? I have in mind just such a case.

Again the necessity of taking X-ray observations from different angles for accurate localization of foreign bodies is here well illustrated.

If wider experience proves the value of wild honey locally, or *Apis mel.* internally, in cataract, it is great discovery. However, a correct diagnosis is very important. I have seen a number of cases with every appearance of hazy lens, which proved to be a discolored aqueous, which cleared up in due time, much to my surprise.

It would also be interesting to know whether there was any of the honey bee poison, *apis mel.*, in the honey, or whether the effect was due to some other cause or ingredient.

The classic case where a man, also in California, was cured of severe rheumatism after being badly stung by bees, will be recalled. Certainly the treatment of cataract by wild honey, or *Apis mel.*, can do no harm; and the successes reported by the essayist well deserve a full trial, even though we remember the *Succus Cineraria Maritima* for cataract, so vaunted by trade journals, but so little valued by oculists.

GENERAL DISCUSSION.

C. GURNEE FELLOWS: I see a loophole of escape from the conclusion that the internal remedy cured a cataract. It is not an unknown thing nor an impossible thing that a traumatic cataract with rupture of the capsule should be cured spontaneously by absorption. Such a thing might occur without reference to any remedy that may have

been used. I think that you will find a great many doubting Thomases among as to the efficacy of Apis in cataracts. It would be a much better test if you could show opacities of the lens, not traumatic nor recent in origin, cured up by a remedy. I understand that Dr. Lewis has several cases where success has been obtained by Apis besides the one described in his paper.

G. A. SUFFA: Did the refraction change at all?

F. D. LEWIS: Vision was so low that that point could not be determined. I cannot say as to that.

NEIL J. BENTLEY: A very large number of cases of eye injury come to me from the large automobile works in Detroit. In the last two years I can show two cases to prove the truth of Dr. Fellows' contention that spontaneous cure sometimes takes place. The lenses were injured and opacities developed and in both instances cure resulted without the use of Apis or any other internal remedy. I would like to be able to say that I had three cases to prove the point—we always like to bring forward three cases—but I cannot, for the third case I had of the same kind did not completely absorb. The absorption in this last case was from below up, while the other two cleared up from the center outwards. In one that did clear up there was a subluxated lens in the right eye while the left had a traumatic cataract, the result of penetration by a piece of steel. His vision is now 20/40ths in the left eye with a $+7\text{ D} + 2\text{ D c} \times 120$ compound lens. I think it could be improved by an operation, but he is not so badly off. The two cured cases are to the point because absorption took place without any remedy being used. This is a kind of work that I take a great delight in. I would like to speak of another point in connection with the subject: Dr. Lewis mentioned taking out foreign bodies by posterior sclerotomy. That is a better method, I think, than trying to attempt to draw the foreign body around the lens, through the pupil and into the anterior chamber. Theoretically and in books that works out all right, but practically it does not. You will find that in spite of the greatest care the iris will bulge out by the pressure of steel, as it is drawn by the magnet and receive such rough treatment that considerable traumatic inflammation will follow it. I now have every case of foreign body in the eye X-rayed and located, and if it proves to be in the posterior chamber I do not try to draw it forward, instead I do a posterior sclerotomy and take it out that way. The subsequent in-

inflammation is much less and the men go back to work quicker. I can use atropine once or twice and get dilatation lasting a week, and you men who use much atropine know what that means. You cannot do it with much inflammation present.

G. A. SUFFA: Do you use a giant magnet?

NEIL J. BENTLEY: Yes, I use a giant magnet; it is not as large as the one I saw at the New York Ophthalmic Hospital. What I use is called a giant magnet, it is the Victor giant magnet. I use a strabismus hook in conjunction with it. This magnet is not as strong as the big ones; they can be made of any strength. I have seen some used to raise huge iron beams—half a ton or more—at a time.

G. A. SUFFA: I have seen magnets used so strong that they pretty near pulled the eye out of its socket. A magnet with a small tip with which you can penetrate is far better. You can make a small incision in the sclera, insert the tip of the magnet into the vitreous chamber and then turn the current on. I think that if Dr. Lewis has such a tip he would not have had so much trouble.

PRESIDENT: If there is no more discussion I will ask Dr. Lewis to close the discussion.

FRED D. LEWIS: I did use the magnet in the way spoken of. This particular case was in no hurry to go back to work because the Employee's Insurance Company was paying him his salary just the same as if he were working. Hence he was willing to wait any reasonable length of time. So I considered it a good chance to see whether the internal remedy would or would not clear up a cataract. I had my brother in consultation and his verdict was that there was nothing else to do with that lens except to remove it.

I have reported only this one case in the paper but I have had dozens of cases in the last two years in which I have used the internal remedy with more or less success. Only a short time ago a woman came to me with a cataract; she had only 20/70ths vision; after giving Apis internally for a month she came back with 20/30ths vision. About a month ago I had a case in which the presence of any vision at all questionable. I used the best shadow tests I could but was unable to get the letter at 20/200ths. Apis certainly improved her vision, but no record could be made of it because it was too far gone to make accurate tests. She is still improving and feels better; her vision at the last test was 20/70ths.

Another case was that of a young woman employed in an automobile works in Buffalo. She had been compelled to give up her work on account of failing eyesight. She was given some different kind of work instead because her employers thought well of her. I found her vision to be only 20/50ths. There was no question about there being cataract because it showed up clearly under side light. Under Apis her vision has gone up to 20/40ths. I could report many cases for I have seen it over and over again. One case that I operated on cleared up slowly and the vision was not satisfactory. Under Apis she is doing well. Her daughter reports that she is seeing better and feeling better all the time.

C. L. RUMSEY: Do you diagnose a cataract by direct or oblique light?

FRED D. LEWIS: By oblique illumination.

PRESIDENT: It has always been my opinion that when a member presents something new before the section, he is entitled to have his findings investigated fairly by a Committee appointed for that purpose. Dr. Lewis has proposed something which I think has not been suggested before, viz.: the use of Apis in incipient cataract and makes considerable claim in results. Shall we appoint a Committee to try out Dr. Lewis' suggestion and report next year?

G. W. McDOWELL: I suggest that one man be appointed in the hospitals throughout the country so that more opportunities to experiment will be offered.

PRESIDENT: If you have a Committee of two or three you will have the thing done; if a great number, you will fail. We do not have to depend upon the Committee entirely, any member can try it out.

C. GURNEE FELLOWS: I move that the chair appoint a committee of three to investigate the claims of Apis to curing cataracts and to report next year. Seconded.

G. W. McDOWELL: That will do very well. My idea was only to get the best results.

PRESIDENT: If you are ready for the motion I will put it.
Carried.

PRESIDENT: I will appoint on this committee: C. Gurnee Fellows, of Chicago; Charles H. Helfrich, of New York; Dean W. Myers, of Ann Arbor, Mich. |

188 Franklin St., Buffalo, N. Y.

PHLYCTENULAR CONJUNCTIVITIS AND KERATITIS.*

HENRY L. GOWENS, JR., M. D.

THE etiology, pathology, treatment, prognosis and prevention of this disease of the eye is so well known and the occurrence of it is so very common that the writer wishes only to bring some phases of the subject to your notice.

ETIOLOGY.—The writer has observed among cases of phlyctenular conjunctivitis and keratitis that in individuals of any age who have been bottle fed in infancy instead of being breast fed: first, they seem to be more susceptible to the disease; second, they have the more severe form of the disease, and third, they are more often the subjects of recurrent attacks of the disease. It is also observed that this disease occurs not only among the poor where there is lack of organization in the family, but also among a class of children who would be well nourished if it were not for the fact that they have their liberty in the choice of food stuffs notwithstanding the advice of their family physician and oculist.

PREVENTION.—The crusades against numerous things, alcoholic beverages, narcotics, vice, adulterated food stuffs, etc., should be augmented by an *anti-sweet society* among children, for many are the children who are attacked by this disease because of their self-prescribed noonday diet. For those who attribute this disease to a tubercular diathesis, there is much work to be done by societies for the prevention of tuberculosis in driving from the vicinity of schools the vendor of candies and sweets who has tuberculosis or a chronic bronchitis. It has been observed that too frequent child-births has been the cause of recurrence of this disease in young mothers.

Children who have once had this disease should report to the clinic or to their oculist or to their family physician at regular intervals, and at whatever time there is the slightest feeling of discomfort of photophobia in the eyes. Any refractive error, it matters not how small, should be corrected, as it will prevent any undue harm being done in

*Presented at Meeting of Amer. Hom. O., O. and L. Soc., Baltimore, June 26th, 1916.

overcoming a simple hyperopia, a simple myopia, an hyperopic astigmatia, a myopic astigmatia, the compound h. or m. astigmatia or the mixed astigmatia.

PROGNOSIS.—The writers feel that in the light of modern industrial requirements, the prognosis has been underestimated. Only the education of the public will reduce the number of those near-blind individuals refused employment as well as opportunities for other vocations in life because of their deficient vision due to phlyctenular conjunctivitis and keratitis.

1636 Walnut Street, Phila.

THE SEATING OF CHILDREN IN OUR PUBLIC SCHOOLS AND ITS RELATION TO DEFECTIVE EYESIGHT.*

J. HOLBROOK SHAW, M. D.

THE men whose thought and teaching has, in the past, done most to influence the development of our common or public school system were not unmindful of the responsibility for the physical welfare of the child which the educator must assume. Remarkable as has been the growth of the public school, we have not as yet travelled more than a part of the way lighted by these great minds. Comenius (1592-1671) realized the importance of the special senses. "For," said he, "do we not dwell in the garden of Nature as well as the ancients? Why should we not use our eyes, ears, and noses as well as they?" John Locke (1632-1704) taught that physical health is of the first importance. The opening sentence of his "Thoughts on Education" is, "A sound Mind in a sound Body is a short but full Description of a happy State in this World."

Rousseau (1712-1778) and Pestalozzi (1746-1827) were also fully alive to the necessity for looking after the physical welfare of the child.

In the year 1800, about the same time that the common or "vernacular" school, so-called in contradistinction to the exclusive Latin schools of the Middle Ages, had taken firm root and started its phenomenal development, we have perhaps the first record of an investigation of the condition of the eyes of school children in a treatise quaintly entitled

*Read at Meeting of Amer. Hom. O., O. and L. Soc., Baltimore, June 26, 1916.

"Healthy and Weak Eyes," by A. G. Beer, followed in 1813 by a report of the investigations of James Ware, of London. Abroad we find Szokalski, of Paris, publishing the results of his studies in 1848, followed by Schurmeyer, of Baden, in 1856, Von Jaeger, of Vienna, in 1861, and Rueta, of Leipzig, in 1866, and Reck, Alexander, Gaertner and Cohn in 1867.

Professor Cohn, whose investigations and conclusions have contributed so largely to our knowledge on this subject, examined the eyes of 10,060 children in the schools of Berlin and vicinity. In 1885 Randall collected 146,522 examinations and published his conclusions in the *American Journal of Medical Science*.

As a result of these studies, it has been established that hypermetropic refraction is more frequent than emmetropia or myopia, particularly in early childhood, that the emmetropic eye is comparatively rare, probably about 10 per cent. practically emmetropic, not absolutely, the percentage remaining about the same throughout school life, and that myopia is extremely rare or absent before the beginning of school life, advancing steadily in percentage with the progress of the pupils in the schools. Professor Cohn's statistics show a progressive increase from 1.4 per cent. in five village schools to 59.5 per cent. in the students in the university. Investigations in this country, while they do not show as high a percentage of myopia in the university students, demonstrate its progressive tendency and correspond very nearly with the European statistics in the lower grades.

Professor Cohn's statistics also show that not only does myopia increase in frequency with school life, but also in degree. In this connection it is interesting to note the results obtained by Dr. Derby, of Boston, who examined the eyes of 254 students at Amherst college, and four years later found that not only had the 35 per cent. of myopia present at the first examination increased to 47 per cent., but that the average degree of myopia had increased from 1.8 diopters to 2.4 diopters. If this represents the progressive rate of increase in the degree of myopia in college students, it might be justified to assume that the eyes of the children in the grades would show a more rapid rate of increase as they are in a more plastic condition and more susceptible to influences which operate towards the development of myopia.

The investigations of Leonard P. Ayres for the Russell Sage Foundation have thrown a new and somewhat startling light upon the

situation. His analysis of the results of a general physical examination of 7,608 New York school children by physicians of the Board of Health shows that *"defective vision alone increases slowly but steadily with advancing age."* All other defects, he tells us, decrease rapidly with age, enlarged glands from 40 per cent. at 6 years to 7 per cent. at 15 years; adenoids from 23 per cent. to 3 per cent.; enlarged tonsils from 40 per cent. to 14 per cent.; defective teeth from 65 per cent. to 31 per cent. Defective vision *increases* from 17 per cent. to 26 per cent.

A further result of his analysis is at first sight rather puzzling. He concludes from a study of 3,304 children from ten to fourteen years inclusive, that the dull or "retarded" children suffered from various defects to a greater degree than the normal or bright children, except in the case of defective vision. In other words, he finds that there are more bright, intelligent, normal children suffering from defective eyesight than there are dull, slow, backward children with this defect. The natural inference is that defective eyesight does not act as a hindrance to the child in getting an education. This is obviously absurd. There are a number of causes which operate against a true estimate of the harmful effects of defective eyesight from the statistics. Fulkerson calls attention to the fact that defective eyesight does not always retard pupils of good ancestry and physique as they are able to keep their place in spite of the handicap, and Ayres himself calls attention to the fact that many physically sound children are retarded because of outside interests. Again unless all were tested with a cyclopegic, many backward children with hypermetropia would be classed as normal and as myopes are almost invariably studious, have scholarly instincts and maintain good standing in spite of their defect, they go to swell the number of normal or bright children with defective eyesight, although no one would contend that the myopia was not a disadvantage.

It has then been established upon good authority that eyesight deteriorates with school life. What the specific causes are which contribute to this unfortunate result, it should be our particular business to determine. General hygienic methods such as the ventilation and proper lighting of school rooms are too universally recognized as indispensable to need more than passing mention, but what of the school furniture and the seating of the children in our public schools? In order to learn what types of school furniture were being used in the cities of the United States, Dr. James Warren Sever, of Boston, ad-

dressed an inquiry to the school departments of all cities of over 25,000 inhabitants as shown by the United States census of 1910, and found a surprisingly large number contented with but a small percentage of their total equipment adjustable. Dr. Sever publishes data received from 87 cities. Out of 65 making any statement as to this feature of their school furniture, only 16 reported all furniture adjustable, 24 cities reported a partial equipment with adjustable, but made no definite statement as to the proportion; 3 reported "a few" adjustable, 4 reported "one row in a room," which would probably be about 20 per cent.; 2 reported 1/6 of their furniture adjustable, 3 reported 1/3 adjustable, 1 reported 90 per cent. adjustable, 1 reported 8.1 per cent. adjustable, 1 reported 25 per cent. adjustable, 1 reported 22 per cent. adjustable, 1 reported 18 per cent. adjustable, 1 reported 20 per cent. adjustable, and 7 cities reported no adjustable furniture of any kind. If in the larger cities where, presumably, the welfare of school children is most carefully studied, so inadequate a proportion of a type of furniture which is conceded to be essential to the best interests of the child is used, we can hardly hope that the larger number of children in rural schools are as well cared for in this respect.

Children are prone to bend over their work in school, a fault which is encouraged by fatigue of the back muscles from lack of support from the chair back in the lumbar region and a desk too high or too far away. Stooping over the desk with the eyes only a few inches from the work is obviously unnatural and harmful. Such a position tends to produce permanent postural curvature of the spine, prevents full normal expansion of the lungs in breathing and causes insufficient æration of the blood, so essential to mental processes, cramps the stomach, induces congestion of the eyeball, puts undue pressure upon its delicate structures and encourages the development of myopia.

What then is the proper working distance, and are the children in the public schools working at this distance? A special commission appointed by the American School Hygienic Association in 1911 reported that the distance of the book from the eyes should never be less than 12 inches, and Shaw, in his classic work on School Hygiene says, "Oculists agree in demanding that the book or writing paper should be distant from the eye at least 12 inches, and they hold that when the book or paper comes nearer to the eye than this myopia is favored."

In order to determine at what distance the children in the schools

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of Plymouth were working, an actual test of four hundred and forty-five pupils was made. The furniture in the rooms where the test was made was put in without expert supervision and adjustments were made by the teachers with such assistance from the janitors as they were able to secure.

TEST BY ROOMS OF THE DISTANCE OF THE EYES OF PUPILS FROM THEIR WORK.

School	Grade	Number of Pupils	Type of Furniture	Min. Dis.	Max. Dis.	Average
A	1	23	Non.-adj. desk and chair unit	4½	12¼	7.94
B	1	20	Desk and chair unit, few adj.	6¼	11	8.53
C	1, 2	30	Adj., two sizes	3	9½	6.25
D	2	15	Adj., two sizes	6	12½	8.43
E	3	45	Adj., two sizes	5	15¾	10.46
F	3	25	Adj., two sizes	5¼	16	9.92
G	3	29	Adj., one size	4¾	14½	10.48
H	4	42	Adj., one size	6½	14¼	8.96
I	5	38	Adj., two sizes	8¼	15¾	9.36
J	5	38	Adj., two sizes	6	17	11.34
K	5	43	Adj., two sizes	7½	14¼	11.63
L	6	34	Adj., two sizes	7½	15	11.86
M	7	32	Adj., one size	6	13¼	10.09
N	Ungraded	21	Adjustable	5¼	14	9.71

The measurements were taken under as nearly normal conditions as possible but in the higher grades especially, it was impossible to prevent some of the children from taking an abnormally upright position, as they at once understood what was being done. Before the measurements were taken the teacher was asked to set them at some task such as writing an original story, and cautioned, if necessary, not to make any suggestions about position. In making the measurements, if an individual seemed too curious he was passed by and taken later, unexpectedly if possible. In every room but one the measurements were read aloud to the teacher who recorded them. In the case of school M, where the investigator recorded the readings of the rule himself, the school showed a lower average than the sixth grade school, although the conditions in school M, such as light, discipline, etc., are equal to any in our system. Undoubtedly had the readings all been recorded silently the general average would have been still lower, as the patent fact that measurements of the distance of the eye from the

work were being taken suggested, as has already been said, a correct position.

The general average distance of the eyes from the work in all the



NON-ADJUSTABLE, ILL-FITTING SCHOOL FURNITURE.

rooms was found to be 9.46 inches, the shortest distance being 3 inches and the greatest 17 inches. A natural increase will be noted in the average distance from the lowest grade up, due to anatomical

reasons, as one would naturally not expect a child of six years to hold the book or paper at the same distance from the eyes as a full grown adult.



MODERN ADJUSTABLE SCHOOL FURNITURE, SET UP WITH A MINUS 1 1-2 IN. DISTANCE AND ADJUSTED.

Something must be wrong in our schools if these 445 pupils may be taken as a sample. That it is not entirely a matter of adjustment of furniture goes without saying, for it will be noted that some schools

make a better showing than others under less advantageous conditions, but the fact that our school children are found by test to be working at an average distance of hardly nine and a half inches, and under ordinary circumstances probably less, when oculists agree that the *least* distance at which they should work is twelve inches, should make us alive to every possible means of increasing the distance.

That the careful adjustment of furniture helps the working distance hardly needs demonstration, but the improvement which took place in this respect in one instance after adjustment is interesting. Too much can not be argued from a single instance and there were qualifying conditions which make the indications less positive, but the facts are given for what they are worth. After the measurements had been taken in school D, the seating was entirely changed at the suggestion of the superintendent. When the furniture was replaced, it was done under careful supervision, the chairs being secured to the floor with the proper relation to the desk, and both desks and chairs accurately adjusted to the individual requirements of each pupil. Another test was then made under the new conditions, the lighting being better and eleven more pupils being seated. The minimum was found to be $7\frac{1}{4}$ inches, the maximum $16\frac{1}{2}$ inches and the average 11.37 inches, nearly 3 inches better than at the first test, and a much higher average than attained by any other school until we come to school K. Even in this instance we have not reached our goal of twelve inches, but we have approached it.

An ingenious measuring gauge has been devised by the manufacturers of school furniture which, when the height of the seat has been secured, by measuring the height of the leg from the floor to the bend of the knee, enables one to determine the height of the desk at once. This gives as satisfactory results as any measurement by rule can, but cannot be depended upon without expert supervision for two reasons, first, because, even with the help of this single apparatus, it has been demonstrated that uniformly accurate adjustments are not to be expected, and secondly, because, should the adjustments be accurate, there are in every room a number of pupils of unusual proportions who will need special adjustments.

The ideal adjustments would require that the rear edge of the desk should project over the seat a so-called minus distance variously stated by authorities but certainly not less than four inches. With

the type of desk generally used this is impracticable, as the pupil would be unable to get into and out of the seat easily. In practice it has been found in the Plymouth schools that a minus distance of $1\frac{1}{2}$ inches gives good results, and does not interfere seriously with movements of the pupil in sitting and rising. It is impossible also with desks made as deep as the Chandler type to get them as low as they should be in relation to the seat, because the lower portion of the desk interferes with the pupil's knees.

The perfect type of school furniture has not yet been evolved, though hundreds of models have been made, for the most part in Europe, but this does not excuse us from doing the best we can with what we have.

Two general adjustments should be made, one at the beginning of the fall term and another probably about the first of May, as the period of maximum growth of pupils includes the spring and summer months, comparatively little change taking place during the fall and winter.

With all furniture adjustable, the desk and chair fixed at the proper minus distance, and properly adjusted under competent supervision, we shall have less eyestrain, fewer round shoulders and twisted backs, better discipline and better work, but as Dr. Cornell, director of medical inspection of public schools of Philadelphia, observes, "in considering the question of school furniture we should bear in mind that any seat is injurious if used by a child for many hours continuously."

Undoubtedly most school authorities appreciate the advantages of adjustable furniture and the necessity for having it properly placed and adjusted under expert supervision, but they cannot get the money for it. Not until public sentiment demands that children shall be properly seated in school will it be forthcoming, and there is no better place for the agitation to start than in the medical profession. Especially does the responsibility devolve upon the oculist to inform himself as to the conditions under which the children under his care are working, and insist that they shall not be subjected to the discomforts and dangers of out of date and poorly adjusted furniture.

CONCLUSIONS.

1. School life has been shown to have a harmful effect on eyesight.

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2. School children are prone to work with their eyes too near the book or paper, a position which favors defective eyesight.

3. Modern school furniture properly adjusted, encourages a safe working distance, both directly by the position of the desk (not too far away nor too high) and indirectly by avoiding fatigue of the back muscles.

4. The placing of school furniture and its adjustment are vitally important in the conservation of eyesight and should always be under expert medical supervision.

5. The medical profession, oculists especially, should inform themselves as to the conditions under which school children work and demand proper seating.

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43 Court Street, Plymouth, Mass.

DISCUSSION.

WM. M. MUNCY: I read with interest Dr. Shaw's able paper, and as he has touched upon many important factors in the examination of the eyes of our school children, it gives me great pleasure to discuss the same.

My experience has been that myopia is not extremely rare among beginners or first-grade pupils. Especially is this true among Polish and German Jews, where one or both parents are myopes of high degree. It is only by frequent examinations, at least twice a year, under a mydriatic that we can keep even the mild forms of myopia from advancing, and even then a large number will show a slight increase from year to year. Our teachers are notified if there is any

appreciable advancement and special request to favor the eyes is made. A number of pupils have been kept from school and all close work for six months to a year which has arrested the progression of the myopia. This condition is to be especially guarded against if the pupil is growing rapidly.

The question as to whether intelligent or dull pupils suffer from defective eyesight leads us nowhere, as those whose eyesight is too poor to do the school work will necessarily be dull, while the majority of children who are studious and over-ambitious, unless guarded in the amount of work done at each sitting, the relationship of such work to the pupil, and the quality of illumination, will invariably develop ametropic eyes.

Outside of the general health of the child there are three factors most important from the visual point of view in the position of every child in the school room. First, the direction of the source of light and the percentage of visuability. Cross lights are very annoying and especially pernicious where they blur the board work.

Second, the distance of the near work, which has been so ably presented by Dr. Shaw with tables which prove much, we may have only guessed in the past. Another noticeable trait, especially among the younger pupils, when reading in recitation, is to gradually get their face into the book in their endeavor to accelerate their mental calculations. I have been astonished at the number of suspected myopes or marked hypermetropes who have turned out to be practically emmetropic.

The third factor, which at least with myopic eyes is just as important as the close work, is the relationship of their vision to the blackboard, chart, or whatever object is held at a distance. So often the large overgrown pupil in the back seat is the highest myope in the room, while many a mild myopic case would be saved considerable effort if seated as near as practical.

I feel that the brightest ray of hope for future advancement in this department of our science lies in the interest the teachers themselves are taking in practical hygiene. One of the keynotes of the last meeting of our State Society of School Hygiene was the emphasis placed upon the necessity of a more thorough training of the teachers in this particular line.

As to desk measurement, any apparatus might do in the hands of

a few who understood the object sought, while the most ingenious measuring gauge will fail utterly when manipulated by others. Mr. Leonard Campbell, of the New Bridgham School of Providence, has built a simple but practical device consisting of a platform upon which is placed a school seat. This is revolved until the proper height is reached, which is read off from a stationary ruled rod at the back. Then the pupil places his arm on the desk which is suspended by means of a window frame, the weighted puleys allowing easy elevation and depression. When this is accomplished the distance is here read off in inches and then both are placed upon his card. The whole apparatus takes up little space, and is on a small, low wheeled platform which allows easy transit from room to room. However, in many of our cities where the buildings are equipped with the best specialized desks, the increasing demands for room has necessitated part time sessions, with two or more pupils using the same desk within twenty-four hours.

Before leaving my subject, I must mention our latest legal adjunct in compelling parents to preserve the vision of their children. Chapter 956 of the Public Laws of the State of Rhode Island and Providence Plantations, provides that every child between the ages of 14 and 16, before it can engage in any occupation or process in which a child of that age may be legally employed, must obtain a physician's certificate of physical examination.

The City of Providence has appointed a physician to make these examinations, and upon finding any visual defect he withholds his consent until the child presents himself with properly fitting glasses. Not only has this affected the children between the ages mentioned, but many parents who have objected to their children wearing glasses, realizing that later they cannot obtain their so-called working papers without them, withdraw their opposition and acquiesce to the nurse's wishes.

FRED D. LEWIS: In the older children where there has been a strain upon the eyes from close work, has there been any investigation made in regard to the development of esophoria?

G. A. SUFFA: This is a subject of utmost importance from every angle and from every standpoint. We are paying very much too little attention to the manner of treating these children and the relation of their educational work to their eyes and general health. The subject has not been taken up in a scientific manner. The discovery of eye

conditions has been largely left to the supervision of teachers with little or no knowledge of the subject. If it is to be left to the teachers then there should be and indeed there must be, if we are to get results, a proper education of the teachers themselves in regard to the whole subject. It is not only a matter of seats, many other factors enter into it. Muscle tests are as important as the visual tests, and should be and can be made by the card or cover test.

If I get going on this subject there is no knowing when I will stop, so I will briefly say that the subject should be approached in a scientific manner, and that Dr. Shaw is on the right track in advocating adjustable seats, as it is an important element in the scientific handling of this problem, and I sincerely hope it will start the ball rolling and finally bring a method of examination that will not only discover the cases of defective vision and the tropias, as it now does, but will recognize those cases of difficult vision due to refractive error not reducing vision and the muscular irregularities now overlooked, which retard intellectual and physical development of the child, and before they have developed into more serious local or general disturbances.

J. HOLBROOK SHAW: The point made by Dr. Lewis in regard to muscular errors is a very interesting one and should be looked into carefully. I do not know of any literature on this subject, but if we were to observe and study the relation of muscular errors and errors of seating in our public schools, I am sure we should find something of great interest to us and very helpful to the children. For the present I must be content to call the attention of the members of this society to the particular point about which the paper was written. In these days when there is so much talk about efficiency and about public health, so serious a defect as occurs right there in the seating of pupils in our school system shall not be tolerated. The children are allowed or induced to do their work at so near a distance that irreparable injury to the eyesight is done. Attention to this point and correction of the position in relation to the work would add immensely to the efficiency of the individual in after life. I hope that as oculists we will pay more attention to the subject than we have in times past.

G. A. SUFFA: I move that if a paper is read and there is written discussion present that it be read even if the author of the discussion is absent.

PRESIDENT: Dr. Suffa, that matter was disposed of by resolution earlier in the meeting.

IRA O. DENMAN: I move that we hear the President's address at this time. Seconded. Carried.

PRESIDENT'S ADDRESS.

Fellows of the O., O. and L. Society:

It gives me great pleasure to greet you here in Baltimore after so successful a session in New York. I trust that we shall go away from Baltimore with the same feeling with which we left New York—that our time and money have been well spent, our mental archives overhauled, the worthless thrown out, and new and better material substituted. A house cleaning occasionally is a good thing; one is surprised to find how much really worthless material he is carrying, occupying room which should be filled with new, clean, up-to-date stuff, or left fallow for new impressions. In addressing you to-day we are going again to depart a little from the established custom with a single exception. It has been the custom in the past for the departing president to leave behind for your consideration some plan or scheme which appealed to him as being beneficial for the society. Unfortunately, these plans and schemes were always left for his successor to carry out and naturally were never brought to a focus. This year we are going to present no new scheme, and, at this time, before proceeding with the real theme of the paper, are going for a few moments to discuss plainly with you only one business proposition. That proposition is our JOURNAL.

Two years ago the Society appointed a committee to secure a new editor and business manager for the JOURNAL. After much labor the committee succeeded in inducing Dr. McCleary to take over the business management and buy the JOURNAL, but only on a conditional basis. This basis was first, that the JOURNAL must be greatly improved and brought up to date; and second, that at least a few members of the O., O. and L. should share with him the labor and financial responsibility necessary to bring the JOURNAL up to the point required. This was done, five men guaranteeing Dr. McCleary they would share with him any loss and all labor which occurred from his handling the JOURNAL. Next, Dr. Mackenzie agreed to take the editorship without

compensation, providing he was properly assisted in getting the necessary material to put the JOURNAL where it belonged. This also was guaranteed.

In the year and a half that the JOURNAL has been under the new management this guarantee has been faithfully carried out. How well we have succeeded in making the JOURNAL what it should be we are content to leave to your judgment.

In the first year, in spite of hard work on the part of all concerned, the JOURNAL faced a deficit at the end of the year of over \$2,000. This was provided for by the committee in conjunction with Dr. McCleary, and a plan was worked out whereby, with proper support and a maximum of hard work, the JOURNAL could be made nearly self-supporting the second year, and it was hoped that after that it could maintain itself. Now the problem presented is this: It is not to be expected that a half dozen men who have no further interest in it than that of the general welfare are going to continue to spend their time and make good a large deficit each year. The JOURNAL must support itself if it is to go on, and its support and maintenance is up to you. It can go on and be the high class publication it is if it receives your hearty support. It can never be an investment nor an individual enterprise. And all that the men who are backing it ask is that it be not a burden of expense. Consider this well and bear carefully in mind that this is your JOURNAL. It is not conducted by a few men as a financial enterprise, for it never can be anything but a financial burden. It has been perpetuated only because we need such a journal and a medium of exchange. It must be made self-supporting and its deficit provided for from a general fund or it will have to go to the wall. What are you going to do with it?

Now as to the general contents of this paper. It has always been my opinion that a presidential address should be a rapid general resumé of the recent advances and improvements in our art, and this in a modest way is what I am going to try to cover. In the two days we have just had in New York the field has already been well combed so that much of what may be said here will be a repetition; but it is a subject which will bear repetition.

First, X-ray work; X-ray machines, plates and technic have been improved to a point where the diagnosis of acute and chronic mastoids, some intra-cranial complications, sinus infections, the explanations

of some laryngeal palsies, early pulmonary tubercular lesions, etc., are made absolutely certain. The man who fails to utilize all the possibilities of the X-ray to-day is as faulty as the man who fails to use a Wassermann in all of his obscure cases.

Another innovation which has opened up a somewhat new field is the vaccine treatment of hay fever and its allied anaphylactic conditions. The determining of the extent toxin to which the hay fever patient has been sensitized is now thought to be possible through the adoption of the Von Pirquet test to the different pollens. With this accomplished, the immunization of the patient is probably entirely a matter of securing a proper vaccine and acquiring an accurate knowledge of its use. This is a fertile field and we may be surprised in the next few years to see the extent to which this principle may be applied to many conditions in our line of work now treated empirically, ineffectually, and often very unintelligently, choroiditis, irido-cyclitis, scleritis and episcleritis, phlyctenular and interstitial keratitis, early otitic sclerosis, etc., etc.

Third is the use of Neo-Salvarsan. I am surprised to find how few men in our specialty make use of this extremely valuable remedy. They seem to feel that it is something outside of the pale of their ability. The older salvarsan with its special technic of 250 c. c. of intravenous injection took time and was a hospital job, but the newer salvarsan with its simplified technic can be used by any man familiar with intravenous work. As an office treatment the rapid and complete subsidence of the disease, which follows its use in some threatening uveal diseases, and in nasal and laryngeal troubles with a positive Wassermann, is one of the joys of practice. Tuberculin, too, is a remedy which is rapidly proving its worth in our specialty, especially in children, and well repays careful study and accurate application.

In the post-operative treatment of painful infected wounds as some mastoids, the electric light application is of some value. The method has been used extensively in France in the treatment of painful shell injuries. The light is applied from a distance of six to eight inches from the exposed wound, the wound and the light being enclosed together in a heavy sterile towel. The steady heat is very acceptable and may be applied for hours at a time, relieving pain and lessening rapidly the amount of secretion. The light itself is supposed to exert some beneficial influence on the suppuration.

Among operative procedures the intra-nasal sac operation is gaining ground rapidly as a recognized procedure and a very satisfactory substitute for excision of the sac. Its technic has not yet been perfected to a point where it is entirely satisfactory but that undoubtedly will come in time. Among the various methods, that of Halle, modified somewhat, has perhaps given the best results. That of Yankauer is too tedious and takes too long.

In cataract work the intra-capsular method of Smith modified to suit the needs and fancies of different men in this country, among them our own Myers, is undoubtedly gradually superseding the extra-capsular method, and unless some more serious flaw develops in it than has yet been apparent, it will undoubtedly be the cataract operation of the future. The same thing is true of the Elliott trephine operation for glaucoma save only that this has the drawback apparently of leaving the patient liable to late infection. Nevertheless, it has largely superseded all other glaucoma operations. The larger conjunctival flap now made may reduce markedly the number of late infections, and if it does we shall have a method which will undoubtedly very largely replace the time-honored iridectomy of Von Graefe.

The Percy method of treatment of inoperable uterine carcinoma is something nose and throat men might well consider. With our ability to reach and treat all portions of the hypo-pharynx, larynx and œsophagus by the hanging method of Killian and Albrecht it may be possible by readapting his instruments to do something with the method in these regions without the great mutilation consequent upon total laryngectomy; excision of the tongue, etc. Undoubtedly it is not to be compared to clean cut surgery in the early stages, but later where clean cut surgery is no longer available it may help greatly. Its one great drawback is that it can not be controlled nor its effects limited, and in a region of great vessels like the neck, unless used carefully, may be disastrous.

Crile's "Anoci Association" is a method to which we, in our work, have paid too little attention. While it has been derided by some of our best surgeons and while it is possible that some of the microscopic cellular brain changes said to occur without blocking and to be absent, with it, indicating absence of shock trauma where it has been used, may be present only in the mind of a man trying to prove his contention, yet it is unquestionably a logical procedure and the clinical

results in the hands of men using it prove its worth. In mastoid work, in neck work, in cleft palate work, in advancements where there is sure to be more or less trauma and shock, try it.

We are learning something now of the etiology of certain local and systemic infections of obscure origin and many of them are being traced to local points of infection. Among these the tonsils have been thoroughly condemned and more recently alveolar infections from carious teeth and infected roots associated with mediæval dentistry have been most thoroughly aired as a common source. Obscure cases of uveitis, keratitis and scleritis have been traced to dental abscesses, and otitic sclerosis undoubtedly has its origin in some focal infection. When one considers that even to-day the average dentist has no more real conception of aseptic bone surgery than did the surgeon of a hundred years ago, that his field is never sterile, his instruments rarely so, his dressings still less so, that his whole technic is mediæval, the prevalence of infected roots and carious alveolar processes beneath crowns, fillings and bridge work is a thing to be expected, not wondered at.

The ductless glands, especially the thyroid, adrenalin and pituitary, we should ever bear in mind as having an important relation to our work. The probabilities to-day are that the three things most prominently in the minds of investigators of disease, viz., focal and endogenous infections, disturbances of the chromaffin system and anaphylactic reactions are closely related and interdependent. The protective action of the thyroid in injection is well known. The influence of the thyroid over the adrenals is also well understood. The adrenals and their product are the vasomotor control; it is probably true that anaphylactic reactions are manifestations of vasomotor paresis or adrenal insufficiency. We see then how it may be that a local infection at some point may so deplete the thyroid or by over-stimulation so change its secretion that its stimulating effect upon the adrenals is lost. Insufficiency of the adrenals means vasomotor paresis which means bronchial asthma, hay fever, perhaps phlyctenular troubles and the osteitis is otic-sclerosis and many obscure nervous affections. These are things which really concern us much more than we have been accustomed to believe. As specialists we have been prone to neglect the general side of medicine and in our efforts to be exclusive have cut off from ourselves in general a very fertile field.

One other thing and I shall have finished. Just a word about Radium intra-venously in those conditions of the fundus associated with high blood pressure mostly associated with the aforementioned cases of autointoxication. Just what its action is I do not know, but radium seems to have the power of reducing the blood pressure in these cases without deleterious effects, possibly by its destructive action upon the toxic products in the blood. In the literature of our field I find no mention of its use in this class of cases, but my own limited experience with it after perusing the reports of experiments conducted by the radium people have led me to believe it is to be a valuable remedy.

W. H. PHILLIPS.

The Secretary, I. O. Denman, appointed as a committee on the address Elmer J. Bissell, of Rochester, N. Y.; Chas. H. Helfrich, of New York, N. Y.; Burton Haseltine, of Chicago, Ill.

Adjourned to 2 P. M.

Note.—After adjournment Dr. G. A. Suffa demonstrated an invention of his own in the shape of an effective, unwinkable eye speculum, to those who remained after the meeting.

MONDAY, JUNE 26TH, 1916.

SECOND SESSION, 2 P. M.

OBSERVATIONS ON THE MODIFIED LOTHROP OPERATION FOR EMPYEMA OF THE FRONTAL SINUS.*

GEORGE B. RICE, M. D.

THE Lothrop operation for the cure of frontal sinus empyema was devised by Dr. H. A. Lothrop, a Boston surgeon, and his brother, Dr. Oliver A. Lothrop, also of Boston.

As in all radical frontal sinus operations, the end conditions to be desired are a clean sinus, adequate and permanent drainage, and freedom from eternal deformity. These conditions are well met in the Lothrop operation.

*Presented at Meeting of Amer. Hom. O., O. and L. Soc., Baltimore, June 26, 1916.

Briefly, the technic as described by Dr. Lothrop is as follows:*

"Preliminary intranasal treatment, including removal of anterior end of middle turbinate and breaking up some of the neighboring ethmoid cells, is advisable because this may effect a cure.

"Roentgenologic examination should be made, both as an aid to diagnosis, and particularly, to determine the anatomic characteristics of the sinus. A lateral and an antero-posterior view should be taken. The patient should be etherized and placed in a position half way between sitting and supine. Just before etherization a pledget of cotton wet with an epinephrin (1:2,000) and cocaine (4 per cent.) solution should be placed in each anterior ethmoid region. This will lessen the amount of hæmorrhage and facilitate working in this locality. These pledgets are removed when the patient is etherized and the nasal cavities are to be tamponed from the posterior nares or with small strips of gauze introduced anteriorly, preferably the former, thus avoiding the annoyance of blood reaching the pharynx. The ether is supplied through a curved catheter or tube entering the mouth.

"The eyebrow should not be shaved. A single, curved, one inch incision is made in the inner portion of the eyebrow, limited externally by the supra-orbital notch; saving this nerve avoids the unnecessary complication of numbness and then paresthesia along its distribution.

"The sensory disturbance caused by dividing the fibres of the supra-trochlear nerve is trivial. The bone is bared of periosteum over a small area at the orbital curve, the presence of a sinus having been portrayed by the Roentgen ray. The sinus is entered with the chisel and enlarged by the rongeur forceps so as to make an oval opening about $\frac{3}{4}$ inch long. The region is then explored with the probe, and pus, granulations and polypi are gently removed, if present, after which this curved probe is to be passed through the ostium into the nose, and left in situ as a guide. Small, cured curetts are then passed down from above just in front of the probe and the walls of the cells on the floor of the sinus are broken up. On account of the proximity of the anterior end of the cribriform plate to the ostium frontale, the posterior angle of the sinus should be constantly avoided. The operation is to be completed by means of burr drills devised by Tilley and Ballinger for

**Journal A. M. A.*, July 10, 1915.

antrum operations and by rasps fashioned for this operation by Dr. O. A. Lothrop.

"The rasps should be used first, and may be passed from above and below through the enlarged ostium cutting forward and laterally. The burrs and rasps are to be used alternately at the discretion of the operator, gradually reaming out all the dense bone of the floor of the sinus toward the base of the nose. This bone includes the nasal crest and spine of the frontal bone, the thick ends of the nasal bones, and the nasal process of the superior maxillæ. The inter-frontal septum should be perforated and then burred away so that the other sinus may be explored. Then by means of the burr the perpendicular plate of the ethmoid should be removed. Through this same opening in the anterior sinus wall and also through both sides of the nose, both of which are now accessible, the dense bone under the opposite sinus is burred or rasped away until, finally, there remains only a thin shell of bone around the whole circumference of the floor of the sinus in front. In all instances, even when only one sinus is affected, experience has shown the wisdom of using the combined floor of both sides. Finally, with the large burr, determine that sufficient bone has been removed from the perpendicular plate and that the cells opposite the lachrymal bone, the agger nasi cells, and other neighboring ethmoid cells have been broken up. If the antrum has served as a reservoir it is wise to make a large opening under the inferior turbinate. The skin incision is to be closed without drain, and all tampons removed. We have not found it necessary to pack the nose for hæmorrhage. Blood pressure may be lessened by propping the patient up in bed. A compress bandage should be applied and, after a day or two, a cocoon dressing. There should be but little œdema of the superior lid. The subsequent treatment consists in keeping the nose clean. The sinus cavities are easily accessible to treatment if occasion arises."

I do not suppose it is possible for any surgeon to follow another's technic with exactness; so the original operation is necessarily modified when performed by another. In this sense the Lothrop operation is modified by myself, and in doing this I make no claim to originality.

I have not yet seen the necessity of removing completely the floor of the unaffected frontal sinus, because there has in my cases been ample drainage after removal of the intravening nasal and sinus partition.

I do not believe in the use of a chisel about the frontal sinus if it can possibly be avoided. I, therefore, make the first opening into the sinus by means of a saw-toothed frontal sinus trocar, taking out a button of bone, and then removing as much as is necessary of the antral wall by means of the rongeur forceps, and I prefer rectal anæsthesia.

Two cases are presented for your consideration, one of which (case 2) shows the advantage of this operation over any other.

CASE 1.—Miss L., age 30, consulted the writer on January 13th, '16. Complaining of early morning pain about the supra-orbital region with intermittent discharge from the left side of the nose. The history was difficult to obtain, and indefinite, although the patient thought she had suffered from the early morning pains about three weeks. Another surgeon had two weeks previously removed the anterior portion of the middle turbinated body. Transillumination was good; not much pain on pressure, and argyrol tampons did not bleach.

It was thought best to wait for a time before attempting further operative treatment, hoping that time, and the improved drainage from the previous operation would prove effective. The patient did not come again for a month, and in the meantime had been having local treatment from a third physician, staying in her home for observation during this period. The pains had grown more severe and more persistent, and the patient looked badly. There was some elevation of the temperature, so an X-ray examination was insisted upon. The plates showed a fairly large sinus, with an undoubted empyema. The Lothrop operation was performed at the Massachusetts Homœopathic Hospital on the following day, February 15th. The operation confirmed the diagnosis, and the patient made a rapid and perfect recovery, so far as the frontal sinus was concerned. She developed, however, in the course of recovery, a mental condition bordering on an acute mania, apparently not due to any pathological tissue change, but functional in its nature. From this she made a very slow recovery, and even at the present time has periods of disturbed mentality. The drainage from both sinuses is perfect; there is practically no discharge and no pain. There is no noticeable external deformity.

CASE 2.—This case was of exceeding interest because of the severity of the infection, an unsuccessful previous operation, and the age of the patient. The writer was called to another city to consult with the family physician and another surgeon, on April 26th, 1915.

The history was as follows: Charlie T., age 8 years, was seen by the family physician four weeks previously, who found swelling over and about the left eye, with exophthalmus pain, fever and night delirium, with some discharge of pus from the left side of the nose. A local surgeon was called, who made an incision under the orbital curve, and removed a small piece of bone from the floor of the sinus. An attempt was made at curettment but this was unsuccessful, and nothing was done to establish better drainage into the nose. The after-treatment consisted in irrigation of the nose, and probing of the wound. The pain, fever and delirium continued, but in a milder degree after the operation. The swelling about the eye and the exophthalmus continued. There had also appeared small abscesses under the scalp, two of which had been opened and were discharging freely.

A diagnosis of frontal sinus empyema was made with probable perforation of the sinus wall. Also infection of the frontal lobe and general sepsis. A radical operation was advised. This advice was taken under consideration, and as no improvement had taken place, the following day the boy was sent to the Massachusetts Homœopathic Hospital, where the sinus was X-rayed, and both frontal sinuses found involved. The Lothrop operation was performed that afternoon. Pus was found in both sinuses with necrosis and perforation of the sinus septum; necrosis of the posterior wall on the left side with an opening into the frontal lobe.

The boy made a rapid recovery from the operation, drainage into the nose was perfect, and remained so, and the sinus ceased discharging in about four weeks. The infection of the cranial periosteum persisted. Free openings were made, good drainage established and autogenous vaccine injections given, followed later by mixed phylacogen injections. The boy's general health improved, and he is to-day the picture of health. The cranial periostitis has not entirely disappeared, but as the condition is slowly improving, ultimate recovery from this is reasonably certain.

It will be remembered, perhaps, by some of those present that the Lothrop operation was demonstrated in still another case to the O., O. and L. Society at the clinic held at the Massachusetts Homœopathic Hospital in October, 1915. Those who saw the case will be interested to know that an uneventful recovery took place.

293 Commonwealth Avenue, Boston, Mass.

DISCUSSION.

W. B. KREIDER: Surgery is advanced by the aid of collateral sciences. The Roentgen ray gives a picture of the bony sinuses, giving the surgeon a view of hidden pathology. The frontal sinus, not being of uniform size in the normal subjects, it is well for the surgeon to acquaint himself so far as is possible the extent of pathology and the extent of the operation necessary for success in a given case. The surgeon who is initiative may reach out, having the exact knowledge and create an innovation in an old field and if of sufficient originality may honor the innovation with the name of his "Operation."

This seems the case in the Lothrop operation for the relief of pyemia in the frontal sinus. Possibly the Killian operation has been followed as the most classic.

The individuality of the operation as stated by the Essayist will necessarily be modified by his own technic or skill, and if bold or conservative, as the case may demand, yield the reward of his innovation. Classic surgery does not depend for ultimate recognition on a boldness of cut, a beautiful adapting of incised parts but on its results.

On Surgery of exposed parts, one of the factors entering into the race for recognition is the avoidance of cosmetic traumatism but this alone should not deter from a given line of procedure when necessary for the permanent recovery of the patient.

Surgery of the frontal sinus in many instances has left disfiguring marks of traumatism. When this can be avoided and results obtained, we have obtained a distinguishing feature of the Lothrop operation, namely, a small scar and maximum drainage.

Bryant and Buck, Vol. VI., contains this instructive paragraph:

"In addition to the median septum which is complete, the frontal sinus often had septa which are partial or incomplete. These have two seats of predilection—one at the summit of the sinus, and the other in the backward or orbital prolongation. Partial partitions are found in about ten per cent. sinuses. In about five per cent. of cases there is found a nearly complete partition. It is important to recognize such a partition, as, if present, it will (unless removed) vitiate any operation which is undertaken for the cure of disease of the sinus."

Recognizing the anatomical structure, if anomalous or otherwise, the X-ray plate will present the extent and field of pathological invasion and thus acquaint the surgeon with the conditions to be met, and thus forestall surprises.

I can offer no criticism on the operation or the cases presented. I would, however, make a suggestion and get after the man higher up. No doubt many of these cases that fall under the care of the surgeon had the previous care of an internist and most of these cases of frontal sinus disease can be cured with our remedies plus some form of local treatment.

We live in an age of surgical ambition and diagnostic accuracy, neither one to be despised, but in this trend are we not apt to lose the cunning of the Masters Who studied the Organon, who also gave us a proven therapeutic law that fitted well into the niche of delicate pathology.

Not with a spirit of self aggrandizement, I wish to mention that in a practice covering thirty-five years I have not had a case of pyemia of the frontal sinus, neither do I come with an humble apology for discussing a paper on frontal sinus surgery when I never had the opportunity of witnessing an operation for the relief of pyemia of the frontal sinus. Is this a coincident or an anomaly? Is my experience unique?

It goes without saying that in a practice covering one-third of a century, both in general and special work, that one has had many cases of frontal sinus symptoms. These cases restored to the normal, without pyemic complication through the administration of the indicated remedy, speaks well for our therapeutic law.

Since beginning the writing of this discussion, two cases in adults presented with frontal sinus symptoms:

Case 1 from a severe cold of the head and catarrhal fever, with a sequelæ of frontal sinus symptoms was treated with Ferrum phos., Bell., Gels., and finally Natrum mur.

Case 2 extended over a period of three weeks of home treatment, presented with severe and continuous pain over the right frontal sinus. The three characteristic symptoms in this case were: worse at night. Worse lying down and quick darting pains. Restored in two days under the administration of Bell. and Mercurius, and the heat of the therapeutic lamp, applied directly over the sinus.

To make a future discussion more comprehensive and relevant, I have applied to the clinic for a front seat in a frontal sinus operation. Goshen, Indiana.

FINIS.

In reading the paper the Secretary commented on the phrase, the "eyebrow not being shaved," as probably a mistake for the "eye being shaved."

NEIL J. BENTLEY: I do not think that the phrase is a mistake, for when the eyebrow is shaved it does not grow in just the same way it was before the shaving. It may grow in very bushy or may be less in size than it was or different in some way from the other side. Therefore, I think the doctor intended just what he said so that the eyebrows may be symmetrical after the operation. You can cut through the hair just as well.

BURTON HASELTINE: I suggest that if it becomes necessary to shave one eyebrow that the other be shaven also so that they may both come in the same.

A CASE OF MASTOIDITIS.*

G. N. SEIDLITZ, M. D.

THIS is a case which presents some unusual features, on which account it seems worthy of record.

The patient is a little, undersized girl, nine years old. She has had otitis media purulenta chronica for seven years, the right being the affected ear.

She was brought to me from a small town in Illinois. She was suffering intensely with acute mastoiditis. All the classic pathognomonic symptoms of that disease were present. This condition had existed for more than a week.

I decided to do a simple mastoidectomy, which was the operation of promise in this case, as verified by its favorable termination. Although this was apparently an acute exacerbation of a chronic condition, it must be borne in mind that it occurred in a patient with an undeveloped mastoid, not in one fully matured.

There were three striking, objective symptoms in this case, viz., the enormous inflammatory oedema, the intensely stinking odor of the

*Read at Meeting of Amer. Hom. O., O. and L. Society., Baltimore, June 20, 1910.

copious ear discharge, and a mass of polypoid granulations filling the meatus.

The cutaneous incisions were made according to the White method, exposing the entire mastoid and a little more. A large quantity of foul smelling pus followed. The bleeding was negligible. The soft tissues involved were all more or less gangrenous. The periosteum was partially necrosed. The surface of the mastoid bone was perfect in appearance.

The first osseous incision was made with a mallet and chisel parallel with and close to the posterior border of the meatus, from the ridge to the tip, as is usual. I confidently expected to encounter pus in the mastoid cells. Instead there appeared to be no pneumatic spaces, it was all solid bone. Upon excavating the tip of the mastoid, during this first incision, I exposed quite a large section of the sigmoid sinus. Of course, it is unnecessary to explain that such a situation of the sinus is an anomaly. Two previous similar experiences had forewarned me, consequently had ever after forarmed me with carefulness. I, therefore, did not injure the sinus in any way.

At this juncture it was my impulse to stop, however, I continued to excavate the bone behind the first incision to about the same extent. I also proceeded tentatively toward the antrum. The same solidified bone prevailed. Here I decided to go no farther, to consider this case to be one of involvement of the soft tissues alone. Of course, I removed the granulations as thoroughly as I was able. The usual dressing was applied.

The patient remained in the hospital ten days, during which time her temperature never exceeded one hundred degrees F. She then came to my office daily from December 8th to February 16th, inclusive.

Not long after the patient began coming to my office for treatment I discovered a fistulous opening in the meatus, on the posterior wall, at the junction of the cartilage and bone. Surrounding this there were exuberant granulations in abundance. During the course of the after-treatment, therefore, the wound drained in two places. The mastoid wound proceeded well until about the fourth week, when granulations, even more luxuriant than those surrounding the fistulous orifice in the meatus appeared in it; at one time they attained the size of a small pecan. These became gradually less under the persistent use of escharotics—burned alum, nitrate of silver and sulphate of

copper. The purulent discharge, too, which quite a while previous to this had lost its offensive odor, gradually decreased, finally ceasing altogether. The external wound healed in the usual way. The ear was practically normal as far as external appearances went. To be sure there is a depressed scar on the mastoid. The hearing which had been nil before had recovered its power to the extent of a distance of four inches for the watch.

This status quo prevailed for ten days, when mastoid swelling with discharge reappeared, as did also the meatal discharge. Daily treatments were resumed, and at the end of ten days the discharge ceased once more, and both openings closed again. The patient continued to call on me for observation every few days until she left for home.

May I not hope that the case is cured? One reason for such hope is that the odor had disappeared at least four weeks before the cessation of the discharge. This would imply arrest of the necrotic process. Another is that the hearing has been markedly improved, although not restored to normal.

Eighty days elapsed between the operation and complete healing of the wound the first time. The relapse lasted eight days. At this writing is the same as when she left. The apparent cure has now lasted six weeks for the second time.

I am acutely conscious that my treatment of this case may be subject to and deserving of considerable criticism.

St. Louis, Mo.

A CASE OF PSEUDO-MASTOIDITIS.*

MARY L. LINES, M. D.

PERHAPS the title of this paper is a mistake and the patient not only suffered with true mastoiditis but still has it in the chronic form. It is for the purpose of hearing from the members of this Society that I bring the case. It was because of the almost immediate relief after taking the remedy given that I gave the title, and I am hoping it is correct.

Mrs. C. sent for me on December 5th, 1915. She had been suffering one week with a severe earache, and, under the care of a general

*Read at Meeting of Amer. Hom. O., O. and L. Society., Baltimore, June 29, 1916.

practitioner, using a hot water bottle for relief. I found the drum red but not bulging; there were pain and tenderness over the mastoid, which was her reason for sending for me. Her temperature was 100 degrees. The following day she came to my office, and I did a paracentesis. The ear discharged moderately for about three days, when the drum closed, but the pain in ear continued to be severe, both in ear and through mastoid, that I persuaded her to leave her home, which was in Jersey City, and come to Brooklyn where I could see her daily and use the electric light lamp. The remedies given during this time were Mer. cor. 6x. She was always so much worse at night. She also had Capsicum and Bell. Temperature in the morning would average 99 degrees, while the evening temperature varied from 100 to 101 degrees.

She remained in Brooklyn from December 12th till December 24th, suffering all that time severely, especially in the late afternoon and at night. On the 16th, ten days after the first paracentesis, I performed another one, the drum still being red but never bulging. There was no discharge after the second paracentesis, and the drum quickly healed again. Three days later, on the 19th, I took her over to consult Dr. De Wayne Hallett, her suffering not being relieved by anything I could do for her.

Dr. Hallett did not advise an operation but recommended a poultice over the mastoid, of cresolin and glycerine, and the remedies to be continued.

On December 24th I allowed her to return home, her condition being no worse and she being very anxious to spend Christmas with her family. She telephoned me every morning that her condition was about the same. Her husband bought her one of those cheap electric lamps, which she thought gave some relief.

I did not see her from December 24th, 1915, till the 31st, when she asked me to come to Jersey City and see whether I did not think a mastoid operation indicated. She was suffering so much, the drum by this time was almost normal in appearance, but tenderness over the mastoid continued to be marked. On the 3rd of January I again went to Jersey City, and on the 4th she came to my office. There was no change except that her temperature had become normal, and she continued to telephone me every day till the 11th of January, when I again took her to see Dr. Hallett. He still thought the indications for a

mastoid operation were not present, although the mastoid was very tender and she suffered the same amount of pain.

We discussed remedies together, and on my suggestion we gave her *Rhus tox.* 3x, 1, 2 q. h. The relief was almost immediate. She telephoned me each day till the 24th of January, when I took her to see Dr. Hallett so that he might see for himself that she had entirely recovered.

Since then I have seen her frequently. She has gained weight, looks well, and says that but for a slight buzzing her ear is normal. The appearance of the drum is now thickened and opaque somewhat and the light spot absent. Hearing is normal.

The question of interest to me is—how far was the mastoid involved? Was there only an inflammation, and was it chiefly the periosteum which gave her so much suffering? At no time was there more than a slight discharge from middle ear, and no bulging at the superior posterior wall of the canal, but the pain was continuous and severe, and lasted from November 30th till January 13th, when relief came, after a few doses of *Rhus tox.* 3x, 1, 2 q. h.

DISCUSSION.

BURTON HASELTINE: I am glad——

PRESIDENT: Will you please step forward so that all can hear you.

BURTON HASELTINE: I have never heard anybody complain that they did not hear enough of me. I am glad to have an opportunity to discuss a paper of this sort; it is not always easy to determine whether a case is best managed surgically or with internal remedies. If you are sure that there is pus in the mastoid then it surely must be drained, but you cannot always say positively that pus does exist. I think that this case was a non-purulent inflammation. There was no doubt pus in the middle ear and some sort of inflammation existing around it. The absence of pus is what determines whether it will get well without operation or not. It is a matter of considerable perplexity to carry a patient through a doubtful case like that. The writer certainly deserves credit for having done so well in that respect. *Rhus tox.* is well indicated in inflammation of serous membranes, and it is a fact that the exhibition of the remedy resulted in improvement. I want to congratulate the doctor on managing to get through so well without

operation, also the consultant. They certainly did a clever thing. Operators as a rule do too little with the internal remedy; on the other hand, there are those who try to do too much. I wonder if the committee that gave me the privilege of discussing this paper written by one of our newer members did so on account of my well known suffragette tendencies.

I. O. DENMAN: If the doctor made a paracentesis, she merely made a puncture, rather a minute puncture in the drumhead. I strongly advocate an incision of the eardrum instead of a puncture, beginning well up towards the posterior border and sweeping down to the floor in a semicircle. I think that we frequently fail to get results simply because we do not make a free enough incision for the pus to make its exit. A free incision will be much surer of affording relief than a puncture.

PRESIDENT: A little while ago while being introduced to a stranger by Dr. Myers, Myers remarked that he and I represented the only two cities west of Philadelphia—Ann Arbor and Cleveland. Now I am sure if the case had happened in either of those two progressive towns, an X-ray plate would have been made and the diagnosis cleared up early in the case.

W. B. KREIDER: This case certainly has many interesting points. I have had one that followed along very similar lines. If I had the tongue of Dr. Haseltine I might make it interesting. An adult in middle life came to me with inflammation of the middle ear; when the condition was ripe for operation I performed, not a paracentesis, but an incision, as Dr. Denman has suggested. I had a good flow of pus and treated the case along the usual lines. It healed nicely, and there were no further signs of pus; the hearing was restored; but several weeks after there was inflammation of the mastoid. No doubt if I had lived at Ann Arbor or in Cleveland I would have had an X-ray made and found out that there was a focal point of infection. There was no doubt about there being pus in the mastoid, but was it a case for a radical operation? I could get fluctuation and I injected alypin deep into the tumor and that started pus to flowing through the anterior nostril on the side affected. Plenty of pus discharged through the mastoid opening. Finally a sinus resulted and caries. I then injected Beck's solution, but it did not clear up entirely. It ran on for several months, going once to Joliet for operation, but returning to me. I

used remedies, mainly Silicea. I do not remember whether I used Rhus tox. or not, but it probably was indicated. The therapeutic lamp was used twice a week also. I never had to curette it. It finally healed all up with good hearing and health restored. It was a case in which operation was imminent but which finally entirely recovered without it.

G. W. MACKENZIE: There is a difference between the subjects of "Mastoid Empyema" and "The Indications for a Mastoid Operation." There is no doubt but that a certain number of cases of acute mastoiditis get well without any operation: that is, provided they are not purulent. They get well under rest, remedies and a proper position of the head. On the other hand, there is a far larger number that would not recover without drainage by means of operation. If after a fair trial with conservative measures there is persistent pain, temperature and tenderness behind the ear I believe that it is unsafe to depend longer upon the more simple measures. Simple mastoid operation is after all a rather simple procedure, while it gives immediate relief from pressure. In the case under consideration there was a mastoiditis, and it got well under carefully selected treatment. In my opinion, however, it would have been safer for the patient to have been operated. If it had been my case I probably would have operated early.

PRESIDENT: If there are no more remarks I will call upon Dr. Lines to close the discussion.

MARY L. LINES: As I said in my paper I thought it was an open question whether it was an abscess or not. The patient was an extremely delicate woman and the thought of an operation was a horrible thought to her as well as to her husband and their purpose in coming to me was to obviate an operation at any cost. Hence came an additional reluctance to operate on my part and, in a case in which you are the least bit undecided yourself, it adds weight to the non-operative side. Besides all this there was no hospital where she could be conveniently taken. I have concluded that the title of my paper is a misnomer and that it really was a case of mastoiditis and the word pseudo is not correct.

Brooklyn, N. Y.

THE TREATMENT OF OTOMYCOSIS.*

HOWARD P. BELLOWS, M. D.

THE true nature of otomycosis was first generally recognized by the medical profession in 1867 upon the publication of a case by Schwartz, although two cases previous to his are on record. It is sometimes called *otitis externa parasitica* with reference to the vegetable parasite, or fungus, which is its essential cause. The early recognition that the characteristic inflammation of the external canal and drumhead was due to the growth of a fungus within the ear led from the first to a practically uniform plan of treatment. This was simply to remove the offending parasite, reduce the local inflammation if excessive and then repeatedly instill some solution which would prevent the further development of the parasitic germs. The first recorded cure was made with a solution of acetate of lead, two grains to an ounce of water. Then came other recommendations as the result of the experience of different men, boric acid in alcoholic solution by Theobald; permanganate of potash by von Troltsch, Schwartz and Hazen; carbolic acid by Luca; alcoholic solution of tannin, or aqueous solution of chlorinated lime, by Wreden; hypsulphite of soda by Blake and Burnett; salicylic acid in alcoholic solution by Bezold and Siebenman; Fowler's solution of arsenic; and pure alcohol recommended by Hassenstein and Kuchenmeister. Almost all of these solutions have some advocates at the present day, but supreme among them all and used almost universally stands the alcohol. The boric acid and salicylic acid solutions, which are so justly popular, probably owe most of their efficacy to the alcohol with which they are made.

In some of the earlier writers upon otomycosis one is struck by the simplicity of the treatment described. Thus Politzer, writing in 1882, says, quoting the translation of Cassells:—"After the fungous membranes have been nearly all removed by syringing, the meatus is filled by means of a warm spoon with rectified spirit, which is kept in the ear for at least a quarter of an hour. This procedure is, at first, to be repeated twice daily. As a rule, the spirit can be well borne.

*Read at Meeting of Amer. Hom. O., O. and L. Society., Baltimore, June 26, 1916.

When it causes a burning feeling, it is advisable at first to dilute the spirit with distilled water, and gradually to employ concentrated spirit of wine.

The result of the treatment is so quick, that even after two days no sign of fungus is visible in the meatus. The lining membrane of the meatus and the membrana tympani appear covered with a fine dry epidermis; pain, tinnitus and deafness disappear, and after three or four days' treatment the cure is almost complete.

In order to prevent relapses, I consider it well to advise the patient to continue the application of the spirit at increasing intervals, but at least every four weeks, throughout a whole year."

Later writers sometimes advocate a treatment which is much less simple. Thus Bishop, writing in 1898, says:—"The ear should be syringed with a quite warm solution of bichloride of mercury in water 1:5000. * * * After absolute cleanliness has been affected, the meatus should be filled with warm hydrozone (dioxide of hydrogen, peroxide, H^2O^2). This is left as long as it effervesces, then removed, and the canal is gently dried with absorbent cotton. Now the meatus is filled with a 12 per cent. solution of carbolic acid in glycerine for ten minutes; then this is removed and a saturated solution of iodoform in alcohol is substituted. The carbolic acid does not corrode the tissues in this combination, but acts as an antiseptic, besides anæsthetizing the inflamed skin sufficiently to admit of the strong alcoholic solution being used without producing pain. The iodoform solution is left in the ear with the patient's head inclined to the opposite shoulder for ten minutes, when it is allowed to drain slowly out, leaving a covering of iodoform powder on the surface of the drumhead and walls of the meatus. This treatment destroys any remaining fungi. The canal is then dried and dusted with a coating of aristol, and stopped with absorbent cotton until the next treatment on the following or second day. Should there be a considerable exuding of serum, boric-acid powder may take the place of aristol or be added to it."

Writers within the past five years mostly agree upon a simpler treatment again, but the advisability of continuing occasional instillations for weeks or months after apparent cure, to prevent recurrence, is emphasized as much as ever. Of this point I shall speak later.

As one reviews the recommendations of various authors as to the particular solution to be preferred as a germicide in otomycosis, the number which have been added to the group which I originally cited is striking. We find among them the bichloride and biniodide of mercury, and bichloride of mercury mixed with bicarbonate of soda; borax; formaline; 6 per cent. lapis solution; oxygenated water; lysol; tincture of iodine, and a 10 per cent. solution of nitrate of silver. Among dry powders recommended we find boric acid; zinc oxide; a mixture of both these in equal parts; a mixture of boric and salicylic acid (20:1); stearate of zinc; iodoform; calomel; dermatol; xeroform, and salicylate of quinine.

Coming now to the treatment of otomycosis which I have come to adopt as the best in my judgment, after many years of experience with various procedures, I want first to place clearly in mind the four distinct objects to be attained. First, to properly cleanse the external canal and surface of the drumhead; second, to reduce the local inflammation; third, to effectively destroy all the parasitic germs which may be present and, fourth, to leave the parts in such condition that recurrence will be prevented.

The first object I attain by the gentle but painstaking and thorough removal of the growth which is present by means of the blunt ring-curette, absorbent cotton wound sometimes loosely and sometimes firmly upon the applicator, and only if necessary by gentle syringing followed by drying with absorbent cotton. At this time I establish my diagnosis by microscopical examination of the growth which is removed. I then apply dioxogen in full strength, either upon soft cotton, swabbing it gently in and out for five minutes, or filling the ear with it, if it can be tolerated, and no perforation is present, while the patient lies upon the opposite side, and allowing it to remain until all effervescence ceases, which is usually about fifteen minutes. This is followed by careful drying with cotton and the patient is dismissed with a loose wad of dry cotton in the meatus. This constitutes the first treatment, and I attach great importance to the use of dioxogen at the outset. I do not think its use is very common in this affection since only two of the many authors whom I have consulted make any mention of it. I have used it in otomycosis for years.

If there is much inflammation and the ear has been a good deal stirred up by this first treatment I allow it to rest for two days, while

the patient takes belladonna internally, in the third or fourth decimal dilution. This meets the second object of the treatment. So far as I know only physicians of our school of practice use belladonna for this purpose, but no one who has used it can fail to note its beneficial effects, especially in cases of the severest type.

The third end of the treatment, the destruction of the parasitic germ, is begun at the second call of the patient. The ear is carefully inspected for the presence of any new growth, which is thoroughly removed if found, and the ear is in all cases again filled with the dioxogen in full strength for five minutes, or longer, if there is the slightest effervescence. Allowing the dioxogen to run out the ear is again filled with a saturate solution of boric acid in fifty per cent. alcohol. After this has remained at least five minutes the ear is thoroughly dried and the patient supplied with the same alcoholic solution to be used at home, night and morning, for four or five days. The belladonna is, of course, stopped unless there is recurrence of the inflammation.

Should there be any indication at the third call of the patient that the growth is still active I substitute ninety-five per cent. alcohol for the fifty per cent. with what little boric acid it can be made to take up, and continue the home treatments for another period of four or five days, but that I rarely find necessary if the patient has carefully followed instructions. At this third treatment, therefore, I can usually take the final step, the leaving of the parts in such condition that recurrence will be prevented. Absolute dryness is now the essential point. This is attained by dusting the surface of the drumhead and walls of the canal thickly with dry boric acid—first moistening the surface with strong alcohol on cotton for the sole purpose of making the powder adhere to them more closely and evenly. I ask the patient to return in two weeks for final inspection, making usually four visits in all to my office, and if everything is favorable I then remove the dry powder which remains in the ear with strong alcohol and dry it very carefully with absorbent cotton. The hearing is usually found to be as good as before the attack and treatment ends here, in my experience, without any necessity for the subsequent application of alcohol, or other germicide, at intervals for a long period of time, as advised by so many authorities.

Several cases in my hands have been so severe that the drumhead

has been found perforated by the fungus and the inflammation caused by its presence. These cases have yielded under the same procedure save that the solutions are not poured into the ear but carefully applied upon cotton, and more treatments have been required, the perforation ultimately healing.

It is to be noted in connection with these cases that all oily or greasy applications to the ear are to be strictly avoided, both during the attack and subsequently. Also that all instruments used about the ear are to be boiled or otherwise thoroughly sterilized before being used with other patients.

Thoroughness is the keynote to success in the treatment of otomycosis, and dryness is the essential condition to prevent recurrence.

DISCUSSION.

W. D. ROWLAND: When the pathology of this interesting and rather rare condition is intelligently investigated Dr. Bellows' last statement regarding thoroughness and dry tissue leaves little else to mention. He has gone quite thoroughly into the history of treatment and gave us many things of value from his experience with the condition.

Having seen but one case of otomycosis in five years I was led to consult some records as to its frequency. The New Orleans Eye, Ear, Nose, Throat Hospital reports for 1914-'15 out of 484 external ear cases (white), otomycosis existing in 1.03 per cent., and of 141 cases (black), 2.12 per cent., an average of 1.28 per cent. of all cases. The New York Ophthalmic Hospital for 1913-'14 showed 2 cases in 627 external ear cases, or .319 per cent., the same institution for 1914-'15 had 3 cases in 523, or .573 per cent.

Among etiologic factors mentioned by late authorities, the instillation of oils and glycerine is considered important. This furnishes a grease or carbon base upon which the fungus readily grows as a saphrophyte, later becoming a parasite when tissue is invaded. A moist or at times a dry exudate in the canal is all that is necessary for cultural possibility. Bakers and those exposed to the organisms frequently are inoculated, although mechanical injuries from soiled fingers, hairpins and other agents used in the canal to remove cerumen or for the purpose of scratching are to be considered as carriers. Men are more frequently affected than women, and children rarely; this probably shows the role played by occupation and the "ear picking habit."

While oxygen, body temperature and the chemical action of body tissues are attenuative to the fungus development, a certain amount of moisture and body temperature helps, but carbon doubtless is the most important, such as fats from any source, *i. e.*, instillations or glandular secretion. The fungus reaches maturity in five to seven days. Dr. Bellows places stress upon the necessity for cleanliness so that fungi have no medium upon which to develop as saphrophytes, precluding the fact then of becoming parasites upon canal tissue.

Zenker observed hyphæ and conidia (branches and spores) in brain abscess. Paltauf reported a case in which a mould-fungus was conveyed from an intestinal ulcer to the brain and lung. Schmorl and Huebner described thrush metastases in the kidney.

Since it is possible for yeasts and moulds to become parasitic to the human tissue, and further liable to metastasis, it becomes more necessary that sterilization of the canal and all that goes into it approximates the absolute, and the danger of spreading the infection through perforated membrana tympani to continuous and contiguous structures must be clearly kept in mind.

W. B. KREIDER: This is a paper of interest and importance; while the disease in question may not be common or of frequent occurrence, yet I have had a number of cases, although not having the advantage of living in a metropolis. I have had a few cases in adults, but mostly in children around school age, say, ten years old. They were generally severe cases. They responded to treatment much like that described by Dr. Bellows. For a time I used oil and salicylic acid, but not obtaining very good results, I changed the treatment to alcohol and boracic solution. The peroxide of hydrogen I have not used in the thorough manner indicated in the paper.

F. G. RITCHIE: I trust that I may be pardoned for "butting in" when I tell you that I have had this disease myself. Some eight months ago I had a personal experience in this line. The appearance of the mass removed indicated the presence of a fungus, and, on being subjected to a microscopic examination, was found to be due to the *aspergillus niger*. Both ears were involved.

The same afternoon, when at the hospital, I asked one or two of my colleagues to look at my ears, one of whom removed masses which had accumulated since my superficial attempt at cleaning in the morning. After removing the accumulation and cleansing the canals as

thoroughly as possible with peroxide of hydrogen and drying them, bacillicide was instilled and thoroughly worked in with cotton on the applicator; this treatment, repeated at frequent intervals, for a week or more, produced only temporary relief.

Finally, I went at it myself, first cleansing out the canals thoroughly, using small bits of cotton, so as to get into the angles of the drumhead. I then applied undiluted keimol, which is a preparation of the salicylates of phenol, and found that a single application stopped all trouble for the time being. This treatment was given in the forenoon. The afternoon of that same day I attempted to show the condition to some of my colleagues at the hospital, but on examination they declared that there was nothing to be seen, the canal and membrane being normal.

All went well for about two weeks when there was a recurrence, but a slight one. After cleansing and drying the canals thoroughly, I applied the keimol freely, filling the canals and pumping the liquid back and forth by intermittent pressure applied to the tragus. A couple of treatments put a stop to the whole affair and I have had no trouble of a similar nature since.

BURTON HASELTINE: Did you have any trouble in collecting your bill?

H. P. BELLOWS: That last case interests me; it adds one more to the already long list of medicaments that have been reported as curative in this disease. I did not claim that Dioxogen is curative, but it serves a very useful purpose in cleansing up the site of the growth so that there is very little chance for the fungus to propagate afterwards. The question of the origin of the disease is an interesting one for it breaks out in unexpected places. If the patient is a laboring man, digging in ditches, laying gas pipes, and so on, it is easy to understand how he gets it, but when the patient is a rich man living in luxury and clean in his habits and not frequenting places where it might reasonably be expected to exist it excites wonder. I have had two men living in the richest section of Boston who came to me with the *aspergillus niger* in their ears. I questioned them with interest to see how they could have become affected with it. I found that one of them owned a number of cheap tenement houses in a poor part of the city and had ordered the cellars to be cleaned out. Being a careful man he had

gone personally to see that it was thoroughly done. The other patient had a beautiful place in the suburbs, but one section of it was marshy, and he resolved to have it drained and became so interested in the work that he watched it done and was exposed a great deal. I think both cases are accounted for by these explanations.

Boston, Mass.

TUESDAY, JUNE 27TH, 1916.

THIRD SESSION, 9:30 A. M.

Meeting called to order by the President.

PRESIDENT: The first business this morning is the report of officers. We will first hear the (a) Report of Secretary.

SECRETARY'S REPORT.

The work of the Secretary during the past year has been much in routine. The publication of a revised list of active members was deemed advisable, and a copy has been mailed to each member. Contained therein is the amended by-law relating to qualifications and requirements for membership in the O., O. and L. Members are requested to refer to the same when taking an application, thus expediting the matter over referring the members prospective to the Secretary.

Announcement is made that the Secretary is now in possession of several hundred bound copies of the Transactions of the Society, dating from 1900 to 1913, inclusive, with the exception of the 1901 volume. Members desiring to complete their files will be furnished copies in order of the receipts of such request accompanied by parcel post postage for three pounds for each volume desired.

Your Secretary wishes to make full acknowledgment to those who have assisted him in the preparation of the program, among whom are our worthy president, Dr. Wm. H. Phillips, the general committee of the New York Clinical Session, which you well know abundantly supplied fully one-half of the 1916 program, also Dr. C. L. Rumsey and Dr. T. L. Shearer, of Baltimore, who have generously provided for us in this city.

DR. IRA O. DENMAN,
Secretary.

PROCEEDINGS OF THE TWENTY-NINTH SESSION.

TREASURER: Immediately on the receipt of the three dollars I always notify the Secretary so that he can send the Transactions on. I think there is a list of some thirty names of members who are now entitled to receive the Transactions. This was a rule under the old regime.

SECRETARY: I received this only about three weeks ago.

TREASURER: I will send on to Dr. Denman a list of the men who have paid their dues for three years back and are entitled to the back Transactions.

Moved that the report of the Secretary be received and filed and printed. Seconded. Carried.

(b) Report of the Treasurer.

TREASURER'S REPORT FOR THE YEAR 1915-'16.

Receipts.

Reported balance on hand, Chicago, July 1, 1915..	\$506.69	
Received from initiations and dues	540.00	
Interest on deposit in R. I. Hospital Trust Co...	5.77	
	————	\$1,052.46

Expenditures.

J. B. S. King, on account of services	\$75.00	
Ira O. Denman, expenses of Secretary	74.15	
Dean W. Myers, expenses of President	28.00	
Goodrich Printing Co., programs, covers and envelopes	20.00	
J. B. S. King, on account of services, balance of bill :	25.00	
Ira O. Denman, boxes, postage and binders for JOURNAL	136.02	
Wm. M. Muncy, postage and cards	7.48	
JOURNAL OF O., O. AND L., publishing papers....	200.00	
University Press, insurance on drug provings ...	7.50	
	————	573.15

Balance on hand June 17, R. I. Hospital Trust Co., Providence, R. I.	\$479.31
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Assets.

Cash on hand	\$479.31	
Dues in arrears	559.00	
	————	1,038.31

PROCEEDINGS OF THE TWENTY-NINTH SESSION.

Liabilities.

Expenses of President	\$19.00
Expenses of Secretary	49.18
Expenses of Treasurer, postage, stenog. and stationery	15.20
Bill of official stenographer	100.00
Expenses of local committee and program, printed matter	69.93
Printing of transactions	400.00
<hr/>	
Total	653.31
Assets over liabilities	\$385.00
Total membership	197
Number of new members	7
Number resigned	1
Number of deaths	2

Respectfully rendered,

WM. M. MUNCY,
Treasurer.

O. K.

GEO. M. HAYWOOD,
Auditor.

Drs. Geo. M. Haywood and G. A. Suffa appointed as Auditing Committee to examine the report and report later.

(c) Report of the Necrologist.

G. W. MACKENZIE: There have been two deaths so far as known during the past year, Drs. Eugene W. Beebe, of Milwaukee, and Geo. M. Thomas, of Devon, Penna.

DR. CHARLES M. THOMAS.

Dr. Charles M. Thomas, former dean of the Hahnemann Medical College of Philadelphia and honorary member of the O., O. and L. Society, died at his country home near West Chester in January, 1916. He was sixty-seven years old. He retired from active practice three years ago.

Dr. Thomas was recognized as one of the leading eye-specialists in the United States and was an authority upon the subject. He was a skillful operator, comparable with the best in Europe. Like many

other famous specialists he served an apprenticeship in general surgery before taking up the surgery of his specialty.

Dr. Thomas was born in Watertown, N. Y., May 3, 1849. He was educated in the Central High School and the Hahnemann Medical College of Philadelphia. Later he studied surgery in Europe. He became professor of general surgery in Hahnemann Medical College, where his lectures and clinics were appreciated by all who were fortunate enough to be able to attend them. Eventually, about 1891, he devoted his attention exclusively to the eye, ear, nose and throat specialty and became professor of eye diseases. He was recognized by the profession as a profound student, an able teacher, a brilliant operator and a princely man. He was admired and loved by all who knew him.

He is survived by a widow, three sons and three daughters. Mrs. Thomas was Miss Marion Turnbull, daughter of the late Dr. Laurence Turnbull, of Philadelphia.

DR. EUGENE W. BEEBE.

Dr. Eugene W. Beebe died at Milwaukee, December 18th, 1915. Dr. Beebe was born in Canandaigua, N. Y., on February 21st, 1840. When a boy of twelve years he came west with his father. The family lived on a farm south of Madison, and Dr. Beebe received his education in Dane County Public Schools. He was graduated from the Hahnemann Medical College, Chicago, in 1866, and began practice in Stoughton, Wis. He later removed to Evansville, where he practiced medicine for fourteen years. After special study in New York, Dr. Beebe came to Milwaukee in 1880, beginning practice as an eye, ear, nose and throat specialist.

He was a member of the State Society, a Senior Member of the A. I. H., and a charter member of the O. O. and L. Society. He was also a member of the Masonic Lodge. In spite of his advancing years, Dr. Beebe was progressive in spirit, keeping abreast of the times. He was active in Society work and a ready talker on any subject pertaining to his specialty. He is survived by his widow and a son, Dr. Claude Beebe.

Report ordered filed and printed. Seconded. Carried.

PRESIDENT: At this time we will appoint Geo. W. McDowell and W. B. Kreider on the Board of Censors to act for the two who are absent.

G. W. MACKENZIE: I would like to ask if the men whose names have been presented for membership have offered a thesis. The requirements passed at the last meeting necessitate that each applicant shall present a thesis which meets with the approval of the Board of Censors.

PRESIDENT: We can safely leave that matter to the judgment of the members of the Board.

REPORT OF THE BOARD OF CENSORS.

The names Sage, Ferres, Boyle, Schmidt, Prunes, Kochman, McDermott were read but not all of them had fulfilled the requirement of presenting a thesis to the Board for inspection.

The Board recommended that all those who have complied with all the requirements be elected to membership, and the others only upon condition that they comply with them before the next meeting.

W. R. KING: I move that the recommendations of the Board of Censors be adopted. Seconded. Carried.

G. W. MACKENZIE: Will the Secretary please notify the applicants who are short on requirements and mention the condition of acceptance.

PRESIDENT: If that is settled to your satisfaction we will proceed to the Report of Committees. The first is the report of the Election Committee consisting of all the former presidents of the society who are in attendance.

W. R. KING: The Committee offer the following list of officers for the ensuing year:

President, Gilbert J. Palen, Philadelphia, Penna.

First Vice-President, Charles L. Rumsey, Baltimore, Md.

Second Vice-President, Philip Rice, San Francisco, Cal.

Secretary, Ira O. Denman, Toledo, Ohio.

Treasurer, William M. Muncy, Providence, R. I.

Necrologist, George W. Mackenzie, Philadelphia, Penna.

Board of Censors, Neil J. Bentley, Detroit, Mich., Chairman; L. E. Hetrick, New York, N. Y.; Geo. J. Alexander, Philadelphia, Penna.; J. S. Gains, Jr., New York, N. Y.; W. D. Rowland, Asbury Park, N. J.

Registration.—I. O. Denman, Toledo, O.; W. H. Phillips, Cleveland, O.; M. L. Lines, Brooklyn, N. Y.; A. B. Norton, New York, N. Y.; Burton Haseltine, 122 South Michigan Ave., Chicago, Ill.; M. B. Coffman, Chamber of Commerce Bldg., Richmond, Va.; H. E. Koons, The Pennway, Indianapolis, Ind.; H. B. Bryson, 8039 Jenkins Arcade, Pittsburgh, Pa.; Wm. Rufus King, Washington, D. C.; M. Clifton King, Washington, D. C.; J. B. Garrison, New York; John Strathers Gaines, New York; T. L. Shearer, Baltimore, Md.; C. L. Rumsey, Baltimore, Md.; B. C. Catlin, Baltimore, Md.; G. D. Arndt, Mt. Vernon, O.; John S. Gaines, Jr., New York City; J. R. McCleary, Cincinnati, O.; J. B. S. King, Chicago, Ill.; Wm. M. Muncy, Providence, R. I.

Attendance.—Geo. M. Haywood, 408 Donaldson Bldg., Minneapolis, Minn.; G. A. Suffa, Boston, Mass.; Neil Bentley, Detroit, Mich.; Howard P. Bellows, Boston, Mass.; G. W. Mackenzie, Philadelphia, Pa.; Chas. H. Helfrich, New York; E. L. Mann, St. Paul, Minn.; C. A. Harkness, Chicago, Ill.; F. G. Ritchie, New York; W. C. McKnight, New York; Dean W. Myers, Ann Arbor Mich.; J. A. Ferree, Columbus, O.; Royal S. Copeland, New York; W. J. Blackburn, Dayton, O.; E. J. Bissell, Rochester, N. Y.; H. Bierman, Bloomsburg, Pa.; Herbert D. Schenck, Brooklyn, N. Y.; F. A. Clawson, Meadville, Pa.; J. Holbrook Shaw, Plymouth, Mass.; W. B. Kreider, Goshen, Ind.; Geo. W. McDowell, New York; C. Gurnee Fellows, Chicago, Ill.

Indiana, 2.—Kreider, Koons.

Illinois, 4.—Harkness, Fellows, Haseltine, J. B. S. King.

Michigan, 2.—Bentley, Myers.

Massachusetts, 3.—Suffa, Bellows, Shaw.

Minnesota, 2.—Haywood, Mann.

Pennsylvania, 4.—Mackenzie, Bierman, Clawson, Bryson.

New York, 12.—Helfrich, Ritchie, McKnight, Copeland, Bissell, Schenck, McDowell, Lines, Norton, Garrison, Gaines, Gaines, Jr.

Ohio, 6.—Ferree, Blackburn, Denman, Phillips, Arndt, McCleary.

D. C., 2.—Wm. King, H. King.

Maryland, 3.—Schearer, Rumsey, Catlin.

Virginia, 1.—Coffman.

R. I., 1.—Muncy.

(b) Report of Committee on Attendance.

Number in attendance at the New York part of the meeting, 100; number in attendance at the Baltimore part of the meeting, 73.

Report received and filed.

(c) Owing to an inadvertence the Committee on Press did not make any report.

(d) Report of Committee on President's Address (read).

REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS.

Your committee feel that the thanks of the Society are due the President for the very able exposition of the advances made in our specialties during the past year and particularly for the practical and valuable suggestions he interpolated during their recital. They are all worthy of consideration.

The committee on reading his statement that he was departing, with a single exception, from the time-honored custom of presidents "to leave behind for consideration some plans or schemes which appealed to him as being beneficial to the Society, but which were always left for his successor to carry out, etc.," felt they were going to have an easy time of it. This was rapidly dissipated when they found the exception so adroitly mentioned was the future well-being of the O., O. and L. JOURNAL.

At once it was realized that this was an important subject of vital interest to the Society. Do the members really comprehend and appreciate the immense amount of painstaking, excellent work performed by the gentlemen who have been responsible for its issues? We do not mean their financial help, important as that is, but their literary and scientific contributions.

How many have compared it with other special journals much higher priced and have conceded to themselves that it ranked with the best?

Are there others who would be willing to share in this labor of love, love because no pecuniary reward is possible, or are we so callous as to expect these "angels" to bear the brunt of the work forever? Angels, you remember, have wings and may sometimes fly away.

It is elementary to say that the Society needs a journal, but are you satisfied to have it simply *a* journal or do you want it to continue to be *the* journal.

Your committee feel that few if any would be willing to see it

retrograde which it must eventually if the proper help is not volunteered.

The help needed is literary as well as financial. What do you propose to do about it? This is the accepted time.

C. H. HELFRICH,
J. HOLBROOK SHAW.

DR. G. A. SUFFA: For the past two years the publication of our JOURNAL has been in the hands of a committee that have produced a JOURNAL equal at least to any similar publication in this country. I think we all recognize that fact, but few of us realize, I know I did not until I took the matter up with the committee, the amount of work done and the financial responsibility they assumed in accomplishing these results.

The size of the JOURNAL is fully double what it was. It was formerly made up mostly of papers prepared and read before this Society; now we have many interesting outside matters collected and gotten up by the industry of these men through co-editors, filling whole issues. Not only have they spent much time and labor on this work, which is for the benefit of the whole Society, but they have also spent out of their own pockets quite a large sum of money for illustrations and finishing touches that help make the JOURNAL what it is.

As a financial venture, it has been a failure, there being quite a deficit at the present time, as all journals of this nature are. The deficit is decidedly smaller than last year, and the JOURNAL can be put on a self-sustaining basis by increasing the circulation, bringing added income from subscribers and advertising.

When I fully realized just what this committee has done, it set me to thinking and wondering how long they would hold together and keep up the standard of the JOURNAL unaided under existing conditions.

The thought also came that it was not right that this committee should be allowed to make up the financial deficiency brought about by giving us so valuable a journal, one that has no superior, and that we all want kept at its present standard. It is for this reason that I asked the publisher to enter my order for ten yearly subscriptions to the JOURNAL, to be sent to physicians whom I would designate, not necessarily specialists, but those I thought would be interested in our line of work and likely to become subscribers in the future after they have had a year's opportunity to digest the scientific quality of the publica-

tion. If all of our members would distribute copies of the JOURNAL in this way to prospective subscribers, our next annual meeting would find the JOURNAL on a self-supporting basis, where it should be placed to show our appreciation of the good work of the committee, and where it certainly must be placed to be enduring. It is our duty as members of this Society for each of us to do as much as we can in obtaining an increased circulation, and to show an appreciation, in substantial form, to encourage this committee to keep up the good work.

GEO. W. MACKENZIE: Does any one want to ask questions about the JOURNAL? Drs. McCleary and Haseltine will be glad to answer questions that members may want to ask or to give any information that is wanted. I think that we should call on Dr. Haseltine anyhow.

BURTON HASELTINE: The part of the work that I am personally proud of is the fact that it was owing to my persuasive power that Dr. Mackenzie consented to be editor and Dr. McCleary business manager. The members are all familiar, I think, with the work that resulted subsequent to the report that the committee made two years ago. You appointed a committee of four, Drs. Phillips, Schenck, McDowell and myself as chairman of that committee. I reported that we had worked out a probable or tentative plan to make it a journal of this Society; we hoped that we could put it on a self-supporting basis. Dr. Mackenzie consented to be editor but not alone; he wanted help—others to work with him. We thought that there was material to make the journal a little better than any other and different from any other in the field.

If it was to be as big and as expensive as we wanted to make it, it could not be expected to make its own living from the start, but we hoped it would grow if we made it good enough. A number of good men, members of this Society, agreed to help in an editorial capacity. That is, they agreed to act as editors of special numbers in co-operation with the editor-in-chief. The results you know. Thus the tentative plan inaugurated has become a solved problem; we have demonstrated to you that it can be done; it will continue to be solved if more men will come out and act in the editorial capacity as they are needed. Men must also come forward and guarantee the business manager against financial loss in the obligations which he incurred in his endeavors to make the JOURNAL a good one. The question is as to the future of the JOURNAL. Do you want it to go on with its present standard or a better

one ensured, or do you want it to close up with the record of two successful years? We can quit now with honor if we want to quit. We can go ahead on the same plan that has been proved to be successful. As I see it there are four things to be done. One of them must be done by every member, some members must do two of them or three possibly. The simplest thing to do and one that should be done by everybody is to write an article for the JOURNAL at least once a year. This to supply good material; each man should do better work than the average and should have better illustrations. Even if he has to spend some money to bring his article out in proper shape.

The second thing to do is to be willing to act in an editorial capacity once in two or three years for a single issue. It should be considered as a privilege; we have had prominent men, influential medical men who have written for this JOURNAL and been glad to do it. Almost every member of this Society is in touch with prominent men and they should keep in mind every opportunity to improve it.

The third thing is to support it financially, not by donations so much as by subscriptions. Subscribe yourself and get others to subscribe. Each one can make himself a business manager in that way.

Help also by carrying your card in it; some of you can use your influence to get advertisements of articles, instruments, etc., used by specialists. As specialists we are of financial value to those commercial instruments and should naturally have some influence with them. When you buy an instrument call attention to the advantages of reciprocity. Most concerns approached in that way will see the point. Let's see, have I mentioned four points yet?

A VOICE: No, only three.

BURTON HASELTINE: Well, the fourth is about the same as subscribing for the JOURNAL, namely, send paid-up subscriptions to men not specialists, where you think it will do you most good. These need not be scattered broadcast, but sent in your own limited field; if a general practitioner, for instance, has sent you a case, send him a complimentary subscription for a year with your compliments. It will do you more good than anything else. As to preparing a whole issue as a special issue most men here could do it well. You could take plenty of time to it; you would be given plenty of notice; it may be a year from now. That is about all I can say. Last time we said that

we thought we might be able to do it, now we tell you that we can do it.

G. W. MACKENZIE: We might do as they do in campmeeting; have a seat up front for those who are willing. Dr. Bentley would you be willing to take an issue of the JOURNAL under your editorial management?

NEIL J. BENTLEY: Yes.

GEORGE A. SUFFA: At some later time I will do it. Who else is willing?

C. L. RUMSEY: Yes.

C. H. HELFRICH: Yes.

F. G. RITCHIE: Yes.

H. D. SCHENCK: Yes.

G. W. MACKENZIE: Of course, the editor-in-chief is always glad to co-operate with the associate editor and fill up the breach if there should be one.

PRESIDENT: After this discussion I am sure that we all are fairly well acquainted with the status of the JOURNAL. I tried to give its condition, its needs and its finances in my address and the efforts that had been made to make it a success. This discussion has brought it home to all of you, and I think that we all understand the state of affairs. We need the support of every member; it is not an individual journal, it belongs to the Society; each one should take a personal interest in its success. The financial needs will be best helped out in the way suggested by Dr. Suffa, namely, each man to subscribe for five, ten or fifteen yearly subscriptions and send them with his compliments to his professional friends; that will help the JOURNAL and it will help him. You all have friends in the profession who send cases to you for consultation; you cannot do a better thing for the JOURNAL than to send a complimentary subscription nor a better thing for yourself than in this way. These extra subscriptions, together with the increased advertisements that will follow, will put it on a self-supporting basis. This will give us a better JOURNAL, and instead of having five or six actively interested in it, we will have two hundred and fifty men interested in it; that is, every member of the Society will feel a personal interest and pride in it. I believe it is the most valuable asset of our Society. Each one should be interested in it in both a financial and literary way.

J. R. MCCLEARY: Anyone here who would like to state the num-

ber they will agree to take for the following year? We manage these indirect subscriptionse so that the recipient knows all about it. The name is turned over to our secretary who sends a letter that doctor so and so has sent the JOURNAL for the ensuing year with his compliments. When the year is up we write a letter to each of these indirect-subscribers stating that the complimentary subscription is drawing to an end and try to get them to subscribe on their own hook. It is always a courteous letter. Many have subscribed on their account as a result. A complete report will be made at the end of the year.

IRA O. DENMAN: If you try it you will find that it makes an endless chain. Of the twenty men I sent complimentary subscriptions to last year, more than half continued their subscriptions.

H. D. SCHENCK: One point is quite clear to me now and that is that this committee has been too modest. Do you realize that there has been \$2,000 borrowed, on which interest is being paid to run this JOURNAL, and that it is the committee who are paying the interest. It will make you understand what that means to the individual men who make up the committee; besides the devoted work that they are giving to it, they are also out of pocket. I move that this Society most heartily commends the work of the editorial committee and those who have had the JOURNAL in charge since the change was made two years ago, and that we, the members, are in thorough accord with their plans, and one and all resolve to do our utmost to make it a greater success in the future than it has been in the past.

Seconded. Carried.

G. W. MACKENZIE: Will not Dr. W. R. King subscribe for some of these extra copies?

W. R. KING: Perhaps I will later.

BURTON HASELTINE: It is only fair to the considerable number of men who have gotten out issues as special editors to state that they too spent money to make their issue a success. I understand that that wonderful article by Dr. Palen on the tonsils cost him \$250.00 for extra illustrations and so on.

W. M. MUNCY: It ought to be a good time now to vote how much money the Society is willing to spend on the JOURNAL next year.

Moved that the Report on the President's address be adopted.

Seconded. Carried.

PRESIDENT: Is there any unfinished business? If so it is now the

next order. There does not seem to be any. The next thing on the program is new business. Is there any new business to come up?

H. D. SCHENCK: I move that an appropriation of \$500.00 be made from the treasury for the publication. Seconded.

IRA O. DENMAN: It was as a measure of economy that this Society decided to discontinue the publication of our transactions as a separate volume. Our experience since has proved very conclusively that it is a false economy. When you add together the cost of the binders and the postage the saving over the separate volume was very small and the disadvantages were obvious. We soon found out that there was nothing to be expected in special prices for there are only three binderies in the United States that handle the self-binders, and they all charge the same price, by agreement, I suppose. The price is 46c. each, and the cost of postage is from 15c. to 50c., according to the distance. The much more desirable printed and bound form cost only about \$200.00, while this self-binding form came up to about \$136.00. Personally, I very much regret that this break in the line of the handsome bound volumes was made. I should very much like to return to the old form even if it cost \$64.00 more. That is very little for the satisfaction of having them in bound form. I move as an amendment that we return to the old form.

DEAN W. MYERS: I second the amendment.

NEIL J. BENTLEY: What about the papers read here, they would all go in, would they not?

CHAS. HELFRICH: I am opposed to the proposition of publishing the Transactions for the reason that members who receive the Transactions will not subscribe for the JOURNAL, many of them at least. The Transactions published separately will leave a loophole for some to cut out their subscriptions to the JOURNAL, knowing that they will receive the papers read here anyhow.

GEO. W. MACKENZIE: That might have been true before the new management, but hardly now. When Dr. Moffat was editor of the JOURNAL the proceedings of these meetings made up more than one-third of its contents; under the new management, and with more reading matter, our proceedings make up less than one-sixth of the contents, so that if the JOURNAL is cut a proportional amount of the material is lost.

J. R. MCCLEARY: If any members here want the Transactions in

book form they can have them bound for seventy-five cents a volume, and thus keep the entire line unbroken. This only contains about one-twentieth of what the JOURNAL publishes.

PRESIDENT: Personally, I can see no need of the amendment at all. It seems folly to supply binders at such a cost for the binder and the postage. Each one should be able and willing to bind his own JOURNALS if he prefers that form. I think that we should do away with the amendment and cut out the order for the binders, too.

WM. R. KING: It seems to me that members of this Society should have something to show for the \$3.00 dues that they pay, without regard to the JOURNAL. They formerly were furnished the Transactions for that and it seems to me that there must be a balance on hand from that fund after paying running expenses. Many subscribe for a goodly number of copies of the JOURNAL, all subscribe for at least one, then what becomes of the three dollars dues? Surely members should have something to show for it. When you get in new members you have got to show them something for their money or they will drop out. Some provision should be made by which members could get the Transactions in bound form. I am afraid that I could not get together all the issues of the JOURNAL for the last couple of years. Perhaps I am a careless man, but I have not been able to get together complete sets, and I like to get my Transactions in volumes that I can keep. I can then use it as a prompt reference and as a directory of the members to get the names and addresses of colleagues. When I come to look matters up in the scattered JOURNAL perhaps I cannot find the one that contains the thing I want to find. Some plan should be devised by which the Transactions, including the proceedings of the business meetings and the papers read before this Society, could be furnished for the three dollars dues, as it was formerly done.

GEO. J. ALEXANDER: It is important that every member should get a copy of the business proceedings; it is part of the duty of the Society to provide every member in good standing with the printed business proceedings. For that reason alone it seems to me that the bound volumes should be continued.

J. R. McCLEARY: Every member of the O., O. and L. Society is furnished with a report of the Society's proceedings free of charge, whether he is a subscriber for the JOURNAL or not. The September

issue contains the business transactions of the current meeting; it is known as the Secretary's issue in which he submits his report and is furnished to all members, non-subscribers as well as subscribers.

G. A. SUFFA: While I agree in a way with Dr. King that it would be a good thing to have the Transactions of the Society in bound form, we must remember that we are up against financial difficulties. If this was a very large Society it could be taken care of very well. I think it would be wiser to save the money spent for binders—those who desire it can have their own copies bound as pointed out by Dr. McCleary.

W. R. KING: The trouble is to find all the JOURNALS at the end of the year.

DEAN W. MYERS: I withdraw my second. A great many members do not realize the extent of the obligation that we are under to the business manager and the gentlemen composing the editorial committee. If they have to dig down into their pockets to support the JOURNAL besides putting all the work into it that they have done, it will not be long before it comes to a stop. We will lose the JOURNAL and we will deserve to lose it. We must do all we can to support it as our own JOURNAL and try to wipe out the indebtedness that already exists. If we just sustain it and no more, nothing will be done toward wiping out the \$2,000.00 debt that already exists. Just because Dr. King does not care enough for his JOURNAL to keep it is no reason why the whole Society should be penalized. The men who shout loudest for the bound volume are the ones who allow dust to cover them on the top shelves.

W. R. KING: I thank you, sir, very much. Thank you, sir.

Dr. Schenck's motion was put and carried.

DEAN W. MYERS: I move that the action of the Society providing for binders for the JOURNAL be rescinded. Seconded. Carried.

Dr. Coons, of Danville, Virginia, asked for the privilege of the floor which was granted. He then invited the Society to attend the Missouri Homœopathic Society occurring next fall.

IRA O. DENMAN: There is another matter that comes under new business. Something that so far as I know has never occurred before in the history of the Society. A member prefers charges against another and asks that he be expelled.

Dr. Geo. C. Von Mater, of Peru, Ind., prefers charges against

Dr. A. A. Eikenberry, of Indianapolis, Ind. The correspondence is here.

(Letters read.)

DEAN W. MYERS: I move that the matter be laid upon the table until such time as both men can appear before the executive committee, and that the secretary be instructed to write to both gentlemen informing them of this action. Seconded. Carried.

H. D. SCHENCK: I would like to go back to the second order of business of this session and under Reports of Special Committees make a report for the committee on the subject of the College of Surgeons. I am sorry to say that despite our efforts that we have very little progress to report during the past year. The College of Surgeons has elected a director Professor Bonar, of the Iowa State University, at a salary of ten thousand dollars a year to manage its affairs. Dr. Bonar said to me personally and also to Dr. Wood that he would take up the matter of the applicants presented by this committee and thrash it out before the Credentials Committee of the College. We saw Dr. Bonar at the recent Congress of Surgeons, and had a half hour's conference with him. We went over our complaints and he promised to take the matter up. He said that he had just returned from the south where he had met and had interviews with various State Committees, and taken up individually the cases of men who had as they thought complied with all the requirements and yet had not been elected to membership.

He promised us that he would do the same thing for us in the east in November. I communicated with him later about our troubles but he has never done as he promised in taking up individual cases and settling them one at a time. He told us what a grand institution the College of Surgeons was and what broad views and great visions he had, and so forth, but he did not state definitely just what the plans for the future were nor exactly when he was going to attend to our affairs. He maintained that the State Committees were responsible for the trouble we had been having about our membership. He presented a plan for doing away with the State Committees and instead having a recommendation of local units for the different parts of the states. The attempt to improve matters by the new plan met with a great deal of opposition and was harshly criticised, so that

the director did not have a real pleasant time, nor the members either, I guess. That is the status of everybody at the present time; that is, we are still up in the air. There have been many promises but so far not much has been done. We have extorted a promise from them that they will notify a man if he is permanently turned down, and so far as I know about it, none of our applicants have received such notification. The present committee of this Society desires to be released; none of us would consent to reappointment. If the Society desires representation I suggest that you appoint a Nominating Committee first to make nominations for the committee which is to represent the Society.

PRESIDENT: What is your pleasure with this report.

DEAN W. MYERS: I move the work of this committee be delegated to those members of this Society who are on the Board of Governors of the College of Surgeons.

BURTON HASELTINE: The Board of Governors will respectfully decline the honor.

Moved that the report of the Committee on the College of Surgeons be accepted and the committee discharged. Seconded. Carried.

ORAL AND SINUS SURGERY UNDER NITROUS OXID-OXYGEN ANÆSTHESIA IN THE FOR- WARD INCLINED, SITTING POSTURE.

IRA O. DENMAN, M. D.

PHILOSOPHIZE as we may upon the great mystery of human life, speculate and theorize upon the whole plan of existence; be we orthodox or evolutionists, the predominant fact is, that we are here on earth for an indefinite period, and that our residence here is pleasurable and profitable or the contrary, according to numerous conditions in and about us.

The range and variations of the human race are so great that there are but few things common to all men. Some one has said that the six feet of earth is the common level, but before that state is reached, there is a proposition upon which all men, great and small, rich and poor, learned and unlearned, may unite, and that is that good health is the greatest blessing of Life. Health is more to be desired than anything else in the world. True, it must often be impaired or lost in order to be appreciated, but when lost, its regaining becomes the supreme object in Life. Fortunes, great and small, are laid down at its shrine. Sickness and death are terms which strike terror to the hearts of all men. Nature's strongest instinct is self-preservation. It pervades all forms of life. To it is due the perpetuation of all life. This instinct is predominant in the human species. We call the antithesis of health disease. The guardian of health and the relentless foe of disease is the physician.

If then it is given to us—and I beg to be understood to include under the term "physician" all who labor in the field—under whatsoever heading, be it internist, dentist, anæsthetist, surgeon, ophthalmologist, laryngologist, or the family doctor; if as I say, it is given to us to foster and protect the thing of supreme value to all classes of people should we not feel proud of our calling, and see that such pride is not unmingled with a due sense of the grave responsibility which we assume to our fellowmen upon donning the mantle of the greatest of all professions.

The age of truly great progress and scientific accomplishment in medicine and surgery dates from the discovery of anæsthesia and bacteria. True, there are many diseases which are not due to bacterial action, but in this discussion we shall consider only those conditions which arise from infections, and some of their surgical requirements. Again, we find a division of infections as to their origin, either within or without the body, into exogenous and endogenous.

In recent years we have heard much of focal infections, and to-day we are endeavoring to measure their far-reaching effects and to cope with some of them surgically.

The profession generally owes much to the dental pathologist for his pioneer discoveries and invaluable contributions to this very important question. In fact, I wish that I might pause here and pay a fitting tribute to the American dentist, who so far outshines his European colleague, as the sun does the moon. Whose prowess no longer lies in the celerity with which he can separate one from his "Ivories," in which age his highest ambition was to become notorious as the "lightning dentist," but who now seeks to excel in prophylaxis, and finds his chief delight in preserving to us that which his predecessor could only destroy.

May I say further, that to my mind the dentist is really a specialist in the field of medicine and surgery, having in his especial care the oral cavity—the gateway to the alimentary and respiratory tracts and so of infinite importance.

The almost marvelous progress of dental science in America is better realized when we reflect that less than two centuries ago the blacksmith was the tooth extractor, while the barber honed his razor to perform phlebotomy, from which practice the modern tonsorial sign gets its blood red stripes.

Only recently the writer was told by a guide in Boston of the versatility of Paul Revere, who before his famous ride, had achieved local prominence through his skill as a silversmith, goldsmith, copper-smith, blacksmith and dentist.

The anæsthetist called in upon those occasions is not described, nor even mentioned, but no doubt he or they were the Jess Willards and Frank Gotchs of that period. No less striking contrast is presented in the field of anæsthesia, from the patient being brutally held upon the table by pugilistic strength, to the calm peaceful slumber for hours if

need be, under modern scientifically controlled anæsthesia—represents the two extremes.

The surgeon must ever be mindful of the invaluable assistance of the anæsthetist to whose achievements in his field surgery owes so much.

Returning to our subject, we know that in points of lowered resistance occur culture beds for bacteria. Some locations for these are the alveolar processes, the tonsils and the nasal accessory sinuses. Pathogenic micro-organisms here find the requisites for their propagation—warmth, moisture and pabulum when such points become veritable hotbeds for the breeding of disease.

The infection invades the lymph and blood currents, polluting the same, and the vital organs are thus supplied by a devitalized and impoverished stream. In time, the individual's health is impaired, either by a general inefficiency of the bodily functions or by the direct entrance of some definite disease.

This is the age of sanitation and prophylaxis in medicine. The whole trend of scientific endeavor is toward prevention rather than cure of disease. A gigantic wave of instruction to the laity, such as the world has never before seen is now sweeping over the country, teaching the people how to keep well. Columns appear daily and weekly in the public press, and these silent monitors do much in the humblest homes to diffuse the light of knowledge concerning this paramount issue. Much of such literature properly conveys to its readers the essentials of pure air, sunlight, good food, proper clothing, exercise, clean streets and alleys, good drainage, etc.

More minutely must we show them that in addition there are great dangers to be found within their own bodies. There are hidden foes—focal points of infection within the tonsils, sinuses and in the gums—which cause many diseases such as rheumatism, endocarditis and tuberculosis, and we must “clean house” by eliminating from our bodies such hot beds for bacterial growth.

Modern surgical methods, under modern anæsthesia, may as it were, pluck the thorn from the flesh and not only lengthen the span of human life, but make for greater efficiency, health and happiness while we abide.

A well known internist states emphatically that “the removal of the focus of infection is demanded as a fundamental principle in the

treatment of systemic diseases of the chronic type," and farther, "to the now well known relation of focal infections as a chief factor in the etiology of acute rheumatism, chronic deforming arthritis, gonorrhoeal arthritis, malignant endocarditis, myositis, myocarditis, septicemia of various bacterial types, tuberculosis, nephritis and visceral degeneration we may add certain infectious types of thyroiditis, with or without hyperthyroidism, pancreatitis, acute and chronic, with or without resulting glycosuria, peptic, gastric and duodenal ulcer and cholecystitis."

Unfortunately, the recognition or diagnosis of a focal infection is not always an easy matter. If it were true that its presence were always a subjective manifestation, then more often would they be detected. On the contrary, however, there are often absolutely no local symptoms, such as pain or soreness, and thus insidiously is the patient's health undermined.

Alveolar abscesses are often unrecognized by the patient and only film roentgenograms disclose their presence. Chronic sinusitis may exist for years unknown, and a large percentage of chronic tonsillar infections which are so extensive as to ruin the health frequently give no rise to sore throat.

The treatment of focal infections is essentially surgical, either to establish drainage and ventilation or to extirpate the infected tissue. I shall gladly omit those renal, appendiceal and other foci belonging to the general surgeon from this paper. Neither shall I presume to discuss those of the alveolar processes before this body, but I shall limit my remarks to the sinuses and tonsils, which are of interest to dentist and rhinologist alike.

The nasal accessory sinuses are the frontal, ethmoidal, sphenoidal and the maxillary or the antrum of Highmore. Physiologically, they act as an auxiliary to the nose in supplying moisture to the air we breathe. They also increase the resonance of the voice and strengthen and lighten the bones of the face. These cavities depend upon two things for their hygienic state: Ventilation and drainage. Any deformity, injury, or disease within the nose which interfere with the ventilation or drainage may prove to be the cause of an acute or chronic sinusitis. The ostia, or openings of all these sinuses, except the sphenoid is found in one vital area in the nose. This is the hiatus semi-lunaris, or the uncinat groove, beneath the middle turbinated body. This is called the "vicious circle" of the nose. It is here that

trouble most often originates. Anything, such as septal deflections, congenital deformities either of the septum or of the middle turbinate, or chronic catarrhal enlargements of the turbinates or new growths, polypoid usually in character, may obstruct the natural ostia of the sinuses at this point. Such obstructions, if long continued, may result in chronic sinusitis. The ethmoids are usually the first affected, the frontal next, then the maxillary and the sphenoid least of all.

The maxillary sinus, by reason of its peculiar position relative to the "vicious circle" being below it and having its natural opening on a level with its roof is by its natural formation particularly susceptible to infections which gravitate into it from one or both of the sinuses situated above. Drainage is unfavorable from it because the secretions have to run up hill, as it were, to the ostium. Infected material, therefore, may be imprisoned in this cavity, which is a veritable trap for the dregs from the nose and other sinuses. At the most dependent portion of this sinus, and thus where the toxic matter would be expected to gravitate and remain, we find the roots of the teeth penetrate into the antrum cavity. These roots are covered only by mucous membrane. With this anatomy dental surgeons are quite familiar, but dental pathologists have been too generous in accepting the majority of the responsibility for antrum infections, claiming as high as 75 per cent. of such cases arise from dental infections. That some cases do owe their origin to a primary dental-caries which breaks through into the antrum, there is no doubt. However, allow me to repeat that the maxillary sinus is an accessory nasal cavity having a natural opening into the nose, and not an accessory oral cavity. I have personally never seen a case of antrum infection which did not present a co-existing intra-nasal infection. Furthermore, given a case of chronic antrum infection, where there has been retention of toxic material for a long time, this material gravitating to the most dependent portion, which is the location where the roots of the teeth penetrate, I ask is it not possible, or at least reasonable, to expect that such teeth may become infected from the antrum, and thus reverse the supposed order? Therefore, I wish to take the advanced position of relieving the dentist of much of the responsibility for the disease of this sinus, believing that infections are often secondary to nasal infections in this region.

Whether or not this suggestion meets with your approval, my next statement must go unchallenged, and that is, that the average dentist

fails to take advantage of the opportunity daily afforded him to be a leader in the field of prophylaxis, so far as certain focal infections are concerned. Too often he thinks only of alveolar foci. He should realize that his opportunity to discover also both sinus and tonsillar disease is almost enviable.

He sees diseased tonsils daily. He can with the aid of a nasal speculum see disease within the nose also daily. The nasal speculum should be a part of every dentist's equipment, and no dental examination should conclude without the inspection of the nose and also the tonsils, not only as a diagnostic, but as a prognostic, measure.

It is my deep conviction that the intent of all surgical operations should be to restore the parts as nearly to the normal state as possible, with the least disfiguration in sinus work, keeping in mind a statement made earlier in this paper, that the health of the sinuses depends upon drainage and ventilation; these we should first restore to a diseased sinus, with the minimum amount of destruction of tissue.

I decry the wholesale disfiguring external operations of radical sinus surgery and plead for conservative assistance to Mother Nature by intra-nasal procedures wherever such means give any promise of relief. No external mutilation of a patient's face is justifiable until after other measures have failed, and the removal of a sound tooth to secure drainage should not be the first procedure.

Intra-nasally, the region of the middle turbinate must be cleared and freed from pressure so that the sinus ostia may remain open. The middle turbinate must often be wholly or partially removed, septal deflections straightened, polypi removed and diseased ethmoid cells opened for drainage or removed if necrotic.

Surgery of the maxillary sinus, a subject in itself, can only be briefly mentioned. Freeing the natural opening alone is sufficient in many cases. This together with a counter opening in the naso-antral wall beneath the lower turbinal, sometimes removing a portion of the antrum end of the same, cures the great majority of cases. Some chronic cases with granulations, polypi and septi require a larger opening in the sinus wall to permit curettage and ocular inspection. For this there have been a number of methods proposed. Experience proves that the more the antrum is left as an accessory nasal cavity, that is, the smaller the opening in the naso-antral wall, the better. Large openings

permit irritating substances from the air to maintain a constant irritation of the sinus lining membrane.

For the surgical treatment of nasal and sinus affections, I prefer nitrous oxid-oxygen anæsthesia in the forward inclined-sitting position to be later described.

The tonsil is without doubt the greatest offender in the whole field of focal infection. Tonsil tissue, especially after the activity of the gland ceases in early childhood, furnishes a most fertile culture bed for micro-organisms. Unlike most other locations, the focus is here accessible and permits of direct ocular inspection. Unlike sinus and alveolar processes, which permit only of drainage followed by therapeutic measures to restore the parts to a normal condition, in the case of the tonsil the whole diseased mass is easily removed, thus eliminating at once from the body the source of toxemia. Unfortunately we meet an issue in the tonsil question which is not encountered in any other infected region—not even now in appendicitis—the teleological question. Every day I am asked: “Why does Nature give us tonsils if they are not for some use?” and “Should they not be treated and retained?” and “If a portion of the tonsil only is diseased, why remove the whole gland?” This last question is often propounded also by physicians, and some specialists still advocate a tonsillotomy, at least they perform that operation.

An attempt to answer these questions here would be an imposition upon your patience, as it would mean opening up a question, the discussion of which is almost as voluminous as was that regarding the appendix two decades past. The following statements, however, are regarded by the writer as facts after careful observations: First, the tonsil function, if it has any, is performed and concluded early in life. Its activity ceases by the eighth to twelfth year after which its decline begins and its tissues are incapable of repair. Second, like the man who says a thing cannot be done is interrupted by some one else doing it, so those who declare that tonsillectomy should not be performed, are confronted constantly by its beneficial effects. I am speaking, of course, of diseased tonsils only, which through careful inspection by lifting the submerged tonsil out of its bed (and it is this variety most often diseased), an accurate diagnosis can be made. After the thorough removal of all tonsil tissue in its capsule, we note a certain and rapid improvement in health in every case.

To say, therefore, that tonsillectomy is overdone simply because it is done frequently, is unwarranted. To say that it is poorly done, that it is attempted by men unfamiliar with its anatomical structure and surroundings, whose technique is faulty, and whose skill is unequal to the surgical requirements of the case, by men who are unable to cope with complications should they arise; whose instruments, anæsthetic, position and methods are conducive to only a partial removal of the tonsil tissue together with more or less mutilation of the delicate throat and palatal muscles, would be a broad statement, but if true, would account largely for the general dread of tonsil operations, and also for the continued ill health in certain cases, owing to the retention of diseased tissue.

That there are certain dangers in tonsillectomy cannot be denied. It is always a major operation and preparations for it should be in keeping with those for major surgical operations. It is always a hospital operation.

It is the firm conviction of the writer that the common dangers can be avoided. Among these dangers are the anæsthetic, asphyxiation from inspired blood and secretions, hæmorrhage and shock.

The anæsthetic of choice is N_2O and O. It is not profoundly toxic such as chloroform or ether. Anæsthesia is quickly induced. Its administration may be continuous, permitting an uninterrupted surgical procedure. There is absence of mucous secretions. Pure oxygen quickly awakens the patient, simultaneously checking any bleeding. There is no nausea following, and it is altogether not an unpleasant experience for the patient.

Inspiration of blood and secretions into the lungs is an immediate danger to the patient by asphyxiation, and a remote cause of pulmonary sepsis, pneumonia and death. Various positions, such as hanging the head downward, placing the patient on the side, and various aspirators and suction pumps have been devised in attempts to exclude these secretions from the larynx, trachea and lungs—for bear in mind that only in nasal or oral surgery including exodontia does blood, *per se*—become a danger factor. A patient can drown from a much smaller quantity of blood inspired than of water, because the attempted inspiration churns it up into a froth many times the bulk of the blood inspired. To avoid this danger in nasal and oral surgery, I have in my technique called to my assistance a great natural force, the force of

gravity. I place the patient in such position as to allow all secretion to flow outward and downward out of the mouth or nose. The forward suspended sitting posture. A special chair is used, capable of attaining this position with all ages and sizes of patients. The operator's stool is quite low, so that the illumination from his head lamp is directed well upward. The patient's body leans well forward, about the angle of 60° , the chin still further declined so that the oral axis is 45° or less. This obviates the necessity in sinus work of the post-nasal plug and, in tonsillectomy, of any swabbing or suction apparatus, and absolutely prevents blood inspiration when nitrous-oxid and oxygen is administered.

Hæmorrhage is reduced to a negligible factor by the dull dissection and finger enucleation, no sharp instruments being employed. The tonsil is simply peeled out in its capsule. It has been demonstrated that the tonsillar vessels very rarely bleed, but that profuse hæmorrhages usually come from the severance of vessels in the surrounding muscles by sharp dissection or cutting through tonsil tissue. Post-operative hæmorrhage is often induced by retching and straining from ether or chloroform nausea and vomiting which we avoid.

The danger of shock in any surgical operation is proportionate to the character and duration of the operation and to the loss of blood.

This technique shortens the operative period to three minutes or less for the removal of both tonsils and adenoids; and sinus work is proportionately shortened and may be done thoroughly. This is due to the perfect view which the operator has in this position; his field clear of blood, without waiting for sponging, no time lost between anæsthetic periods as it is continuous and both tonsils are removed at the same time by two sets of instruments.

The anæsthetic is administered with equal facility in both nasal and oral operations, the process only being reversed. In some cases a partial nasal obstruction renders the oral administration easier than nasal.

In nasal and sinus surgery a special mouth inhaler is used; the gases being expired through the mouth and in oral work, both a small nasal inhaler and a mouth hook are simultaneously employed whereby

the gases can be forced with sufficient rapidity to induce anæsthesia, preventing the inhalation of air through the open mouth.

425 Ohio Building, Toledo, Ohio.

Read before the National Dental Society and the Interstate Association of Anesthetics in joint session, Louisville, Ky., July 26th, 1916.

A NEW CORPORATION.

Announcement has just been made of the formation of a new corporation, called the Victor Electric Corporation, which has purchased the business of the following firms:

Victor Electric Company, Jackson Blvd and Robey St., Chicago, Ill., 110 E. 23rd St., New York City, N. Y. Scheidel-Western X-Ray Company, 737 West Van Buren St., Chicago, Ill., 110 East 23rd St., New York. Macalaster, Wiggin Company, 66 Broadway, Cambridge, Mass., 154 West Lake St., Chicago, Ill., 110 East 23rd St., New York. Snook-Roentgen Mfg. Company, 1210 Race St., Philadelphia, Pa., 110 East 23rd St., New York.

The purpose of the new Corporation is to continue the respective business policies of the above mentioned concerns, and by the elimination of waste, and the development of co-operative service, be better able to serve more efficiently the interests of the medical profession.

The sales and service organization will be much more comprehensive than heretofore, it being the plan to continue all of the present branch offices and open new ones in all sections of the country so that ultimately no member of the profession, no matter where located, will be more than a few hours' distance from a trained man, who can render intelligent and efficient service.

By maintaining a research department to co-operate with the profession in the development of this science it is expected that more rapid progress can be made than has been heretofore, and a greater co-operation secured with the profession as a whole.

The new Corporation announces that it expects to conduct its business in an entirely ethical manner, believing that there is a standard of ethics in business that conforms exactly with our ethics and traditions.

It is also the purpose of the new Corporation to make every customer feel that the pleasant relations existing between them and the various firms will be continued. They wish it to be known that repair parts and supplies for the apparatus of the constituent concerns may be obtained at any of the aforementioned addresses.

The stabilization of this industry is another great advantage

A NEW CORPORATION.

which, with the added economy of production, assures the profession of the greatest values and a conduction of the business along sound financial lines.

The names of those associated with its management, who formerly had charge of the respective merged companies, are men of high calibre and recognized ability and warrant us in wishing the new Corporation the best of success.

REVIEW.

REFRACTION OF THE HUMAN EYE AND METHODS OF ESTIMATING THE REFRACTION. Including a Section on the Fitting of Spectacles and Eye-Glasses, etc. By James Thorington, A. M., M. D. Containing three hundred and forty-four illustrations, twenty-seven of which are colored. Price (postpaid), \$2.50. P. Blakiston's Son & Co., Publishers, 1012 Walnut Street, Philadelphia, Pa.

"Refraction of the Human Eye and Methods of Estimating the Refraction" is an amalgamation of the author's works, "Refraction and How to Refract," "Prisms" and "Retinoscopy." The contents of the above-named books have been rearranged and co-ordinated by amplifications, modifications or deletions, so as to produce a book suitable for all beginners in ophthalmology, and particularly for those who have a limited knowledge of mathematics and who cannot readily appreciate the classic treatise of Donders.

The chapter on Prisms has been very much enlarged, as the average book on ophthalmology gives but little information on this branch of refraction, and, to make it more entertaining, the author has not limited himself to the consideration of prisms in ophthalmic practice alone, and has inserted many illustrations to make the text easy of comprehension.

Thorington throughout the book adheres to the same methods which he for many years adopted in his admirable course as teacher of these branches at the Philadelphia Polyclinic, viz.: beginning with the fundamental problems of the subjects and leading gradually up to more complex. The author is concise in his statements of facts, yet he neglects nothing bearing on the subject. The book is brought up-to-date. It is a valuable one for the post-graduate student and practicing ophthalmologist.

ED.

MANUAL OF OTOTOLOGY. By Charles Edwin Perkins, M. D., F. A. C. S. Illustrated with one hundred and twenty engravings. Price, \$3.00, net, (postpaid). Lea & Febiger, Publishers, Philadelphia and New York.

The author is fitted to write a book on Otology by reason of his many years' experience as a teacher of the subject. In the preparation of this small book it has been the aim of the author to lighten the difficulties and supply data to enable those who thoroughly master them to become capable aurists. The simpler and less serious affections which form the larger part of the aurist's practice have been discussed in full detail as to their diagnosis and treatment, and the orderly sequence in which these topics are taken up, should afford the reader a properly correlated conception of the entire subject. The chapter on Suppurative Diseases of the Labyrinth sets forth the present knowledge of the graver affections of this complex region.

ED.

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Editorial

FIFTH ANNUAL CONVOCATION OF AMERICAN COLLEGE OF SURGEONS AND THE CLINICAL CONGRESS OF SURGEONS OF NORTH AMERICA.

THE fifth convocation of the American College of Surgeons will be held at the Bellevue-Stratford Hotel, in Philadelphia, on the evening of October 27, 1916.

Every one who feels qualified to do so, should make application for fellowship. The purpose of the College is a noble one to which no unselfish physician can take exception, as evidenced by the Fellowship Pledge, which reads:

"Recognizing that the American College of Surgeons seeks to exemplify, enforce and develop the highest traditions of our calling, I hereby pledge myself, as a condition of Fellowship in the College to live in strict accordance with all its principles, declarations and regulations. In particular I pledge myself to pursue the practice of surgery with thorough self-restraint and to place the welfare of my patients above all else; to advance constantly in knowledge by the study of surgical literature, the instruction of eminent teachers, interchange of opinion among associates, and attendance on the important societies and clinics; to regard scrupulously the interests of my professional brothers and seek their counsel when in doubt of my own judgment; to render willing help to my colleagues, and to give freely my services to the needy. Moreover, I pledge myself, so far as I am able, to avoid the sins of selfishness; to shun unwarranted publicity, dishonest money-seeking and commercialism as disgraceful to our profession; to refuse utterly all secret money trades with consultants and practitioners; to teach the patient his financial duty to the physician and to urge the practitioner

to obtain his reward from the patient openly; to make my fees commensurate with the service rendered and with the patient's rights; and to avoid discrediting my associates by taking unwarranted compensation. Finally, I pledge myself to co-operate in advancing and extending, by every lawful means within my power, the influence of the American College of Surgeons."

During the week from October twenty-third to October twenty-ninth, the Clinical Congress of Surgeons will convene in Philadelphia, which city affords excellent opportunities for those wishing to attend clinics. There are numerous hospitals in which there will be held eye, ear, nose and throat clinics, and material in abundance. The members of the O., O. and L. Society expect to hold one or more special meetings to discuss and advance the interest of the Society and the JOURNAL. Everyone interested is invited to attend and take part.

G. W. M.

THE NEXT MEETING OF THE SOUTHERN HOMŒOPATHIC MEDICAL SOCIETY.

The Southern Homœopathic Medical Society will hold its annual meeting in Louisville, Kentucky, November fourteenth to sixteenth, inclusive. Dr. Scott Parsons, of St. Louis, its president, has the promise of several important papers from members of the O., O. and L. Society, who hope to turn out in numbers to boost the Southern Society. The attendance is expected to exceed that of any of its previous meetings. The local committee in charge is lending every effort to take care of the visiting physicians. If you have not joined yet, do so now.

G. W. M.

WHERE SHALL I LOCATE TO PRACTICE MY SPECIALTY?

This is the question that arises in the mind of the newly made specialist, and the one which, when in doubt, he puts to his older and more experienced colleagues.

The question is so pertinent and one that has been put to the editor so often, that he feels obliged to attempt a reply. The responsibility is no light one, and the editor trusts that the suggestions herein contained will be accepted as the best he has to offer. If anyone has other suggestions to offer, which he believes to be better, the editor will be

pleased to publish them for the benefit of those who are seeking locations.

In reply to the original question, there is no one answer to suit all cases. In a general way it might be said that there are plenty of locations waiting for well qualified men but none for others. A well qualified man with a proportional amount of energy and with clean habits will succeed anywhere he goes, whether it be in the city of five million or in the town of five thousand; success is bound to come.

The large city holds out certain inducements, not to be found in the town, among which might be mentioned large medical libraries, clinical facilities for the study of the rarer conditions, medical society meetings and eventually larger fees, but only after one is well established. On the other hand, the larger towns and smaller cities offer other inducements not to be found in the larger cities.

In the larger towns the newly made specialist is recognized earlier; he is thrown upon his own resources from the start and is obliged to operate cases that only the longer established men get in the large cities and he makes a living almost from the start.

Let us take two equally well equipped men, one of whom starts in a large city, the other in the larger town. At the end of ten years the man in the town has done five to ten times the amount of work, including operations, and has taken in a proportionate amount of fees than the man in the city.

Some argue that there are more recognized top-notchers in the cities than in the towns. This may be true, for we are accustomed to assign a place in the hall of fame to the professor in a college who has written a book, no matter how poor it may be or how much of it may have been plagiarized. The editor's observations of men by personal contact and through attendance at society meetings prompts him to believe that, on the average, the men from the towns are the equal in ability of the men from the cities, even though they may have written fewer books.

In the large city progress is rather slow, except where the beginner has exceptional ability and push or someone upon whom he can depend for advancement, or, less elegantly put,—has the “pull”—“Pull” is a short word that means a lot to the fellow who has it, but is an ugly word to the fellow who hasn't it. Fortunately for all concerned, the “push” in the long run will beat out the “pull.”

For a man in moderate circumstances who is bent on settling in a large city a good plan is to start as clinical and office assistant to an experienced and capable man at a living wage.

In the case of the married man with responsibilities and without an abundance of money a living must be assured from the start. For him the town offers by far the best inducement. For the single man without responsibilities and with money to spare, a waiting game in the city may be preferred. On the whole, competition is keener in the city than in the town and will very likely continue to be.

For one who has no idea as to go about in search of a location in a town, the suggestion is offered to take the Red Book of Eye, Ear, Nose and Throat Specialists together with the American Medical Directory and use them as guides. After deciding upon the State in which you prefer to practice, ascertain the population of a certain town from any atlas or directory; then look up the Red Book or the Directory and learn how many specialists of your kind there are in it. Furthermore, you can, by referring to the American Medical Directory, determine more or less accurately the standing of the several specialists through their medical society connections, remembering that the most active and prosperous men are members of Medical Societies which, by the way, is a hint to go and do likewise after locating. Finally, pay the town a visit and learn what you can by direct observation and questioning.

G. W. M.

A LETTER FROM THE BUSINESS MANAGER.

At the Baltimore session of the O., O. and L. Society the organization and management of THE JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY was thoroughly explained. (See 1915 Proceedings.)

It has been a pleasure, to the men associated with the reconstruction of the JOURNAL, putting forth their best efforts in this work.

The JOURNAL now speaks for itself. For the past twenty-one months, your Editor, Associated Editors and Business Manager have endeavored to present to you something specific and unique in a journal of this kind.

The literary material represents excellent work, full, new and original ideas as well as reports and results of cases from men well recognized as leaders in investigating truth.

In planning the publication of the JOURNAL it was decided to keep the text and advertising matter absolutely separate. The reader can readily see the advantage of this.

The next important point is to call your attention to the advertisements the JOURNAL is carrying.

Advertising is a special art in itself to-day. The wide-awake, capable firms are carefully studying the best methods of keeping you actively in touch with their new and reliable products. They are doing this to interest you, to give you the last word regarding their results.

It is these staunch friends that the JOURNAL wishes to call to your attention. Glance over their educational advertisements. Do not stop with reading them, but get in direct communication with them and secure literature pertaining to their product, for we know that our advertisers manufacture a great deal that will help us all towards efficiency. Many times such efforts far more than repay us for the little amount of trouble.

J. R. McCLEARY.

NEUROLOGICAL ASPECTS OF SOME OPHTHALMOLOGICAL PROBLEMS.*

JOHN E. WILSON, M. D.,

New York.

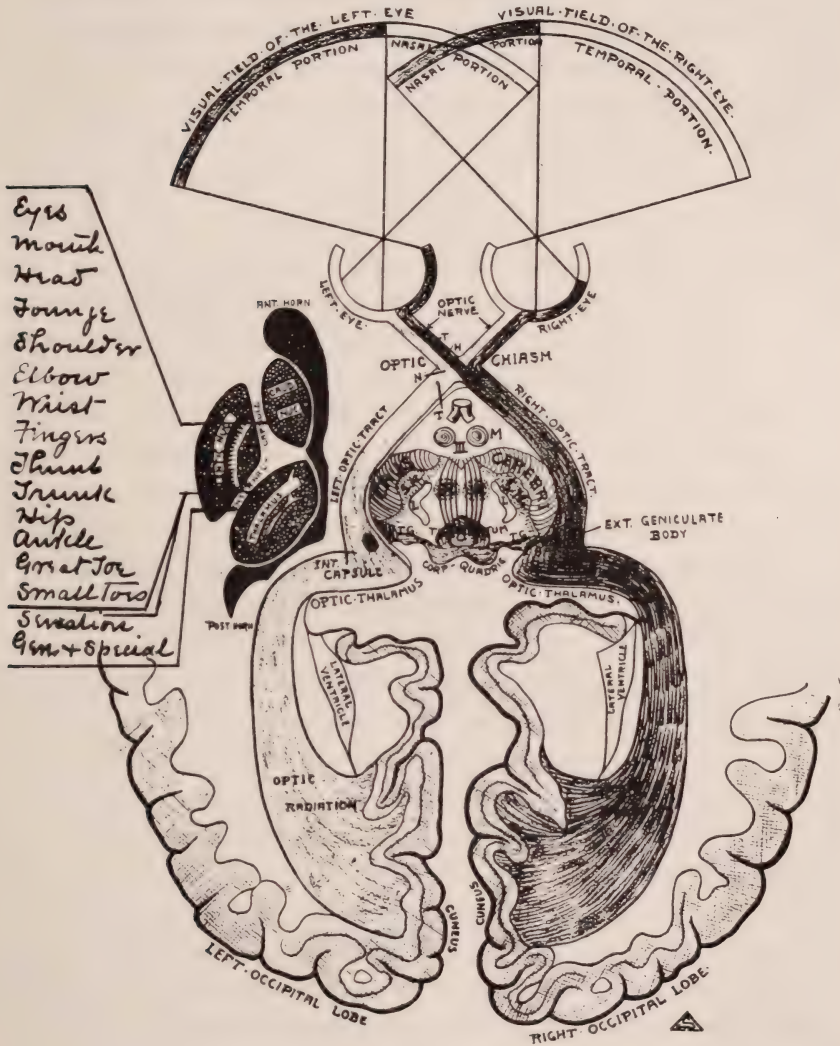
MR. President and Ladies and Gentlemen of the Society: In taking up this subject, I shall perforce, as a basis for my remarks, run over the anatomy of the optic mechanism, with which you are rather more completely acquainted than I am myself.

Taking up the intrinsic or internal musculature of the eye, which produces the pupillary reflex, we must distinguish two sets of fibres: the centripetal, and the centrifugal. The centripetal fibres originate in the amacrine cells (those of the second layer with short prolongations) of the retina, more at the posterior pole than at the periphery. They pass out of the globe in the optic nerve, being distinguished from the visual fibres by their greater size. They decussate in the chiasm, and run in the optic tracts to the external geniculate body, but probably do not enter the anterior corpus quadrigeminus, as was thought to be the fact at one time. Ferrier and Turner burned off the anterior corpus quadrigeminus without interfering with the light reflex, and, therefore, it is now believed that the fibres leaving the external geniculate body run in the lateral aspects of the 3rd ventricle, which underlies the geniculate bodies, and end in the sphincter nucleus, which lies just anterior to the 3rd nerve nucleus, in the gray matter of the floor of the aqueduct of Sylvius, which is the canal conveying the cerebro-spinal fluid from the 3rd into the 4th ventricle.

At this point originate the centrifugal fibres, *i. e.*, in the cells of the sphincter nucleus. These fibres run downward into the pons, uniting with the ciliary fibres, then turn upward, and pass as a separate bundle into the 3rd nerve, which emerges from the region of the crus, just at the superior border of the pons. Coursing in the trunk of this nerve it gains the orbit, where it leaves the nerve, and passes into the ciliary ganglion on the floor of the orbit. From this ganglion it emerges in

*Presented at Meeting of the O., O. and L. Soc., at the New York Ophthalmic Hospital, June 23, 1916.

the form of six or seven roots, which enter the posterior pole of the eyeball, in a ring about the optic nerve, and pass forward between the choroid and the sclera, and into the ciliary body, passing into the substance of the iris, and ending in the sphincter iridis. The amacrine cells, the centripetal fibres, the sphincter nucleus; and the centrifugal fibres,



compose a reflex pupillary arc, and as in most nervous reflex arcs, an interruption anywhere in the arc abolishes its peculiar function. The peculiarity of this reflex, however, modifies the applicability of such a

statement, because while the centrifugal fibres run from the left or the right sphincter nucleus, respectively and exclusively, to the left or the right iris, the centripetal fibres from the nasal half of each eye run to the sphincter nucleus of the opposite side. Therefore, lesions back of the chiasm will be hemiopic, and the effects of a lesion will vary according to its location, in the various parts of their arc.

Lesions of the Centripetal Fibres. Sagittal section of the chiasm will produce a bitemporal loss of both the direct and the consensual light reflex. Sagittal section of the chiasm, and one optic nerve, will produce blindness on the affected side, and a temporal hemianopsia on the other side. There will be a complete loss of the direct pupillary light reflex in the blind eye, and of the consensual pupillary reflex in the seeing eye. There will be a complete loss of the direct pupillary light reflex in the seeing eye, and a loss of the consensual pupillary light reflex in the blind eye when the nasal half of the seeing eye is illuminated, and a retention of the direct pupillary light reflex in the hemianopic eye, and of the consensual pupillary light reflex in the blind eye when the temporal half of the retina is illuminated. Lesions of the tract on the right side produce left homonymous hemianopsia. When the right half of the retina of either eye is illuminated there will be a loss of the direct pupillary light reflex in the illuminated eye, and a loss of the consensual pupillary light reflex in the fellow eye (absence of Wernicke's pupillary light reflex). Illumination of the left or seeing half of either retina elicits the direct pupillary light reflex of the illuminated eye, and the consensual light reflex of the other eye. Lesion of a tract, and destruction of the same half of the chiasm, or the optic nerve on that side, produces the same condition as seen in sagittal section of the chiasm and one optic nerve. Lesions up to and involving the external geniculate body have produced hemianopsia. If it were possible to destroy alone the bundle of fibres of the pupillary light reflex arc between the external geniculate body and the sphincter nucleus there would be no blindness, but there would be loss of pupillary light reflex corresponding to that produced by the lesion of one tract, if one side only were involved, and complete loss, if the bundles on both sides were destroyed. This has resulted from aneurysm, and new growths in the 3rd ventricle in the walls of which are the centripetal fibres. Wernicke's reflex, viz., a half-sided loss of the pupillary reflex upon either the right or left halves of both eyes, is in pure form without hemianopsia, only found in

lesions in the course of the centripetal fibres from the external body to the sphincter nucleus, but as the term is commonly used may indicate such a loss with or without accompanying hemianopsia. This infallibly indicates a lesion of the optic tract or of the basal ganglia, as it never occurs in cases of hemianopsia resulting from lesions posterior to the external geniculate bodies.

Lesions of the Centrifugal Fibres. It is possible to have an isolated lesion of the pupillary light reflex arc only at or very near the sphincter nucleus. In reported cases there has been a loss of consensual pupillary reflex, with preservation of vision on the side affected. Affections of this bundle are almost always associated with 3rd nerve lesions also. Complete section of the 3rd nerve produces total loss of pupillary light reflex and consensual reflex on the affected sides with, of course, ophthalmoplegia, ptosis, and some paralysis of the frontals. As a fact isolated lesions of this reflex arc are rare, but an appreciation of possible symptom groups affords substantial aid in the diagnosis of some obscure conditions, and, broadly speaking, Wernicke's sign directs our attention to lesions of the bulb and basal ganglia.

Argyll-Robertson Pupil. This is a most common intra-ocular paralysis, and it is typical in tabes and general paresis, in multiple sclerosis, in cerebral syphilis, in internal hydrocephalus, and rarely in congenital. Its etiology and pathology are uncertain. No lesion is certain in tabes; Dana says that it is due to a degeneration in the cervical sympathetic, Marina says that it is in the ciliary ganglion. In all cases other than tabes and paresis there have been found microscopic changes in the pupillary arc in the aqueduct.

We will now take up the consideration of the nervous mechanism of the external muscles of the eyes. The combined 3rd nerve nucleus, as I have said, lies in the gray matter of the floor of the aqueduct of Sylvius, just under the corpora quadrigemina, and just above the pons, and it is to be noted that the bundles carrying sensory impressions from all parts of the body, and motor tracts innervating the whole body, lie anterior, *i. e.*, ventral to them, and in close proximity to them in the crus. This combined nucleus is connected by way of the posterior longitudinal bundle with the nucleus of the 6th nerve, lying just below the pons. Injury of the nervous mechanism of the external muscles of the eye may occur from gross structural faults in the development or insertion of the muscles themselves, but so far as

we are concerned they may be considered to result from injury to the nuclei of the nerves, or from physical injury to the nerves in continuity, or from interstitial or medullary disease-processes in the nerves. The blood supply of the oblongata is from branches of the vertebrals before uniting to form the basilar; the nutrition of the pons is by branches from the basilar while the region of the aqueduct is nourished by branches of the posterior cerebrals coming down through the posterior perforated space.

While the etiological agents in the production of lesions of the nuclei and nerves are many and varied, the actual process is almost invariably hemorrhage, or softening, and while softening from thrombosis is extremely common, embolism is rare, and hemorrhage in the bulb represents a very small percentage of the apoplexies suffered by man. An infection or intoxication usually expresses itself in thrombosis producing softening in a nucleus; in destruction of the myelin sheaths, secondarily, by degeneration of the nerve fibres, if it is localized in the nerve trunk. Arteriosclerosis is an unfortunate endowment of the young, a common possibility of the adult, and a physiological attendant upon senility, and the basilar artery seems quite prone to exhibit such a condition, and aneurysmal dilatation of it is not uncommon. It is, therefore, not peculiar that the 3rd nerve is so often the unique site of extra-ocular paralysis.

Another fact should also be given weight at this point. The 6th nerve is peculiar in its long and unprotected course. Arising in the lower portion of the pons, it passes out between its lower edge, and in the upper margin of the oblongata, just external to the anterior pyramid, it pierces the dura at the dorsum of the sella, runs through the cavernous sinus just above the carotid artery, and enters the orbit through the sphenoidal fissure. From this long course it is very liable to injury, and a paralysis of it alone points to the possibility of a fracture at the base of the skull. The other nerves, oculo-motor, may be injured in continuity by traumatism, thrombosis of the cavernous sinus, in whose outer wall they run, and by new growths; they are all, however, more liable, in common with the optic nerve, to be affected interstitially or parenchymatously by the vascular changes resulting from infections or intoxications. Predilection in point of attack is exhibited—just as in disease, processes all over the body, and as inscrutably. We do not know just why an intoxication from lead

should give rise to a multiple neuritis characterized by tremor, little pain or tenderness, and the exemption from paralysis of the supinator longus, while arsenical neuritis is characterized by most exquisite tenderness, an absence of tremor, but with an implication of the supinator, along with other muscles.

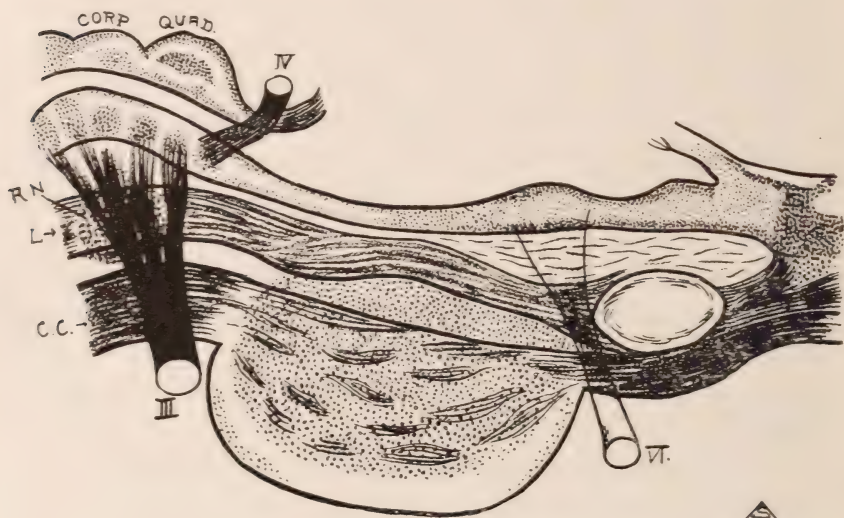
Pathological changes in the blood vessels may be renal, arteriosclerotic, or from syphilis, or senility. Acute bulbar apoplexy is rare, while softening is common. When an apoplexy occurs there is prodromal pain in the neck, vertigo, headache, vomiting, followed by a very sudden apoplectic seizure, with twitching of the face and extremities, rarely general convulsions, face flushed, temperature subnormal, pupils contracted, convergent strabismus or divergence, and later there is high temperature, rapid pulse, dyspnoea and cyanosis. Death generally occurs in from 6 to 20 hours. Paralysis is usually of one side, as the raphe of the pons is quite dense. Bulbo-pontile softening is common, generally from arteriosclerosis, or rarely from embolism. The softening is often very extensive. Nystagmus is a common symptom.

Encephalitis superior of Wernicke, *i. e.*, above the 7th nerve, is analogous to poliomyelitis. It may come from alcohol or influenza, and the pathological findings are punctiform hemorrhages. It causes ptosis, immobility of eyes to a degree, variable nystagmus and reaction to light, possibly optic neuritis.

Chronic ophthalmoplegia may come from tabes, paresis or spinal cord lesions. There are diplegia, ptosis, and then a later extension of the paralysis to the external muscles of both eyes, the functions of accommodation and convergence are often spared, as is the levator palpebræ muscle. It extends to all muscles, but may be checked, yet generally extends. The lesion is a degeneration of the 3rd, 4th, and 6th nuclei.

Bulbar palsy from other causes may be caused by myelitis of the bulb, stabs, or fractures, typhoid, leukemia, multiple neuritis, and tumors of the posterior fossa. Each optic tract ends either in the pulvina of the optic thalamus, the external geniculate body or the anterior corpus quadrigeminus. New axons are sent out from these nuclei regrouped into what is known as the optic pathway which almost immediately appears in a small bundle in the posterior third of the posterior limb of the internal capsule. It passes out of the internal cap-

sule in a bundle which is known as the Radiation of Gratiolet, which curving about the posterior horn of the lateral ventricle and then about the splenium of the corpus callosum, is finally distributed to that part of the cortex of the under surface of the occipital lobe which lies on the tentorium, especially to the portion of it which lies between the calcarine fissure mesially and the parieto-occipital fissure laterally, and is known as the cuneus. This is the cortical representation of vision as a mechanico-chemical operation (visuo-optic center). From the cells of this area stream out new axons which terminate in the mesial part of this tentorial area of the occipital lobe and also that



area lateral to the cuneus, forming a cortical area about the cuneus, both laterally and mesially, which is called the visuo-psychic area, and in which the primitive impressions of sight have been synthetized into concepts of form with shadings of color by the activity of the nervous mechanism. From these last named areas new axons extend to the cortical area about the marginal gyrus on the parieto-occipital convexity where, by the activity of the whole brain, visual impressions become developed into the visual memories which form so large a portion of our stock of knowledge. In order to present the subject of visual anomalies with the most coherence, it is necessary at this point to take cognizance of the fact that determination of color is a factor in our visual memories. Lying upon the layer of rods and cones

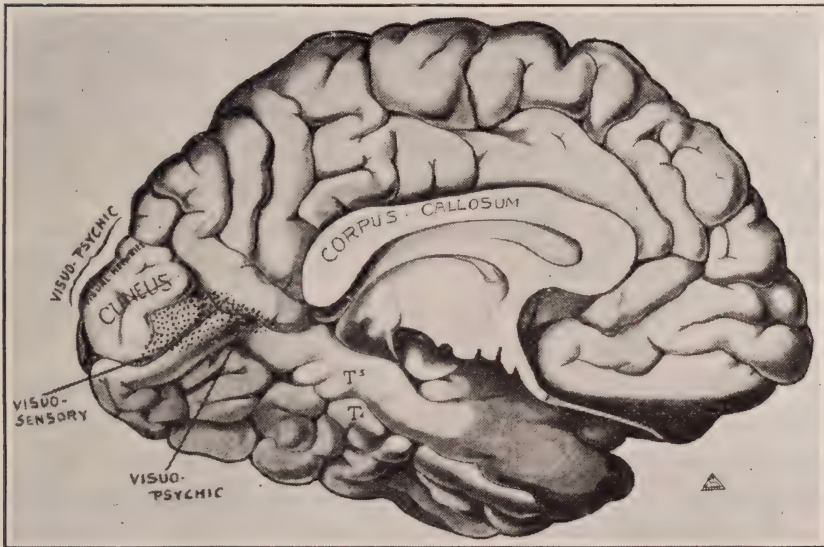
in the retina is a chemical substance known as the visual purple, and disturbances of color perception seem at times to depend upon pathological changes in this substance; there are, however, certain other similar substances in the retina for differentiating our impressions of color, probably one for blue, one for green, and one for red, and possibly one for yellow. These substances constitute a primary sifting apparatus, which is much more elaborated in the external geniculate body. When we reach the cuneus, we find evidences that there is a very definite differentiation of areas for the perception of different colors, and also for blending these impressions into conscious appreciation of the finest shades, so that the visuo-psychic centers derive from the visuo-optic areas impressions which they elaborate into terms of form and shades of color to be passed on to the higher psychic center about the angular gyrus. It follows the analogy of the differentiation of the sensory cortex into areas for the appreciation of touch in one area, or pain in another, of heat in a third, and of cold in still another, but whether in this case these are definite areas or whether they are superimposed layers registering different degrees of whiteness or blackness for interpretation by higher levels is not as yet determined, but one fact has been settled and it is this: if a lesion affects solely the cortex of the cuneus, the sufferer, while preserving perfect vision for white, and for form, will have a half-sided loss of color-perception in both eyes (hemichromatopsia). This is proof positive that the cell's mechanism for color differentiation lies in the cuneal cortex, and that the cells for perception of light as light, *i. e.*, white, is not there, but can be proved positively to lie deeper, as will be evidenced later. Disturbances of color perception fall into two classes, as do all manifestations of function in nervous apparatus. Irritation of a neuron produces exaltation of function, while destruction of a neuron induces paralysis, or loss of function. Irritation of the chemical layers in the retina by disease or pressure will produce phosphenes, fiery rings and sparks, and this is true of irritation of the optic tracts and pathways, clear to the cuneus. Colored vision, however, is usually the result of the absorption of pigments by the vitreous, or of the overstimulation of some one of the selective pigments in the retina.

Returning now to the general problems of sight, we find that sight is just as definitely represented in definite areas as is color. The upper part of the cuneus represents the lower half of the retina, the

lower part the upper half of the retina, the macula is represented in the anterior portion of the calcarine fissure area, while the posterior portion represents the peripheral zone of vision. A loss of function, therefore, in the left upper half of one cuneus will produce blindness of the left lower quadrant in both eyes. From the fact that the macula bundles partially decussate between the two radiations of Gratiolet, macula vision is retained under conditions which more or less completely destroy peripheral vision. The arterial supply of this region is from branches of the posterior cerebral and Sylvian arteries. These are terminal arteries and we find, therefore, as we might expect, softening of small area, making very discrete lesions in many cases, but at the same time it should be remembered that the parent arteries are subject to rupture, thrombosis, embolism and arteriosclerotic processes, and new growth are as liable to occur in this area as in any other. In discussing neurological problems we always take into account the dual character of symptoms, viz., that they may be either focal or neighborhood, and this must not be lost sight of in this discussion. For intelligent attempts at relief we must at times be able to say whether symptoms arise from lesions originating at the point indicated by the symptoms (focal), or are simply the result of pressure from growths originating at a distance (neighborhood). I once had a patient who without previous pain or disability experienced a blinding flash before her eyes, was seized with vertigo, and then blindness came on, which soon passed away. This recurred after some weeks, then general symptoms of intracranial pressure came on, with recurring visual disturbances, and she died in a short time from a tumor, not in the eye, not in the cuneus, but in the centrum semiovale so that it did not destroy, but simply exerted pressure on the tracts in their course. A lesion in the cuneus, or near it, or in the optic pathway, or tracts, or chiasm, produces a hemianopsia as a basic symptom, and by the modification of the symptom, or from the fact that other symptoms are associated with it, we can identify with considerable accuracy in what portion of the optic pathway the lesion has occurred, and whether the visual disturbance is primary or secondary, *i. e.*, focal or neighborhood. If preceding any disturbance of the visual function we have a history of continued headache, vertigo, tinnitus, sensory disturbances in the limbs, trunk or face, convulsions or paralysis, and we may conclude that visual symptoms when they occur are neighborhood

symptoms only, and the same is true if there is a period of intermittency in their appearance, during which intervals the physical symptoms appear and become persistent.

A lesion of the cuneal cortex may be differentiated from the fact that it produces dyschromatopsia, hemiopic in distribution, because it affects only the strata of color perception. If it lies a little deeper, an area of the retina proportionate to the lesion becomes blind to white as well as color; in other words, we have a typical hemianopsia, and this is distinguished from the hemianopsias resulting



from lesions of the tract anterior to this by the fact that complete cortical hemianopsias blot out the visual field to within 5° of central vision, while hemianopsia resulting from lesions anterior to the cortex are less sharply defined centrally by a vertical straight line, and do not approach the area of central vision nearer than from 10° - 15° . When looking at a brain we are at once struck by the proximity of the cuneus to the angular gyrus in the convexity of the occipital lobe, and the great liability of their common destruction by a vascular occlusion or from the pressure of a new growth. Lesions are rarely confined to the area of the cortex, nor does such a limitation persist for any length of time; the subcortical fibres being soon invaded, if they are

not primarily involved in the lesion. Recalling that these subcortical fibres are the avenues of conduction of visual impressions to the area for visual memories about the angular gyrus, it is evident that a subcortical lesion is pretty sure to give rise to some form of visual aphasia (alexia), and as the areas for sight are in the cuneus, and for hearing in the 1st and 2nd temporal lobes, and are interconnected to some degree, the auditory memories localized about the marginal gyrus are apt to be implicated. (This would produce some degree of amnesia.) Subcortical hemianopsia, therefore, is less definite than cortical, and it is apt to be complicated with some degree of visual aphasia, and the patient may also be amnesic. Going forward from this point, we come to the region of the posterior third of the posterior limb of the internal capsule, where the visual bundle lies in close proximity to the olfactory and auditory tracts amid a broadly disposed area of fibres for the transmission of sensory impression from the whole body to the cortex. Our case of hemianopsia may possibly be an accessory symptom in a sensory paralysis of one-half of the body, it may exist with only a slight evidence of sensory change in the body, but be principally localizable by the occurrence with it of a paralysis of taste, smell, or hearing, but as a fact these senses have a very perfect double representation, and a slight response to injury to the auditory tract in the form of tinnitus is about all that can be expected from a lesion upon one side of the brain. Clinically, there is generally a greater or less degree of motor paralysis accompanying the hemianopsia. If one looks at the internal capsule, and realizes its small dimensions, and then takes into account the fact that a cerebral hemorrhage is usually the size of a hazel-nut, but may be as large as one's fist, and that a clot is always surrounded by quite a zone of edema, we can see why hemianopsia from injury to the tract in the internal capsule is generally accompanied by motor and sensory paralysis. If now the lesion compromises or directly affects the optic thalamus, we have been led to believe that aside from causing sensory disturbances there will be a great degree of ataxia, and the production of athetoid movements, but if the lesion is destructive we shall have one other positive symptom. In an ordinary motor paralysis of the face there is no motor response to the will, but the facial muscles still respond to the emotions; destructive lesions of the thalamus abolish this emotional response, while irritation makes the patient pathologically emotional.

That ataxia is always the peculiar mark of a thalamus lesion seems to be generally true, but one case is reported where it was a marked symptom, yet on autopsy the thalamus was found to be intact but the lenticular nucleus was the seat of the lesion. It has long been known that this latter nucleus had a very important role in the coördination of the muscles employed in the production of speech. When the lesion is so far forward as to implicate the external geniculate body we at least have positive proof that it cannot be behind that ganglion, since we now first find the Wernicke's sign in addition to the hemianopsia, *i. e.*, if a beam of light is projected into the hemiopic half of the retina the light reflex is lost, while illumination of the other half of the retina produces a normal response. In addition, it has been found that lesions of this ganglion produce marked disturbance of color perception, as this was the first substation in the sifting process. This associated hemianopsia and hemiopic loss of the light reflex remains a distinctive feature up to and including lesions of the chiasm, but the diagnostic feature of lesions of the chiasm is that it alone produces a bitemporal hemianopsia. To the neurologist this lesion always suggests multiple sclerosis, but it may result from tumors of the pituitary body, new growths of other kinds, and also more usually from the invasion of gummata.

In speaking of lesions in the cuneus we noted the losses and disturbances of color perception. Such losses are often partial and transitory, and in any case are so associated, causatively and physiologically, with other disturbances involving form, that we can most profitably consider in one group visual hallucinations, colored vision, muscæ volitantes, phosphenes and scintillating scotoma. To recapitulate slightly it is to be recalled that if we irritate cortical cells we stimulate function; if we destroy them we abolish function. If then the cells of the visual cortex are irritated by a diminution of the blood supply either from arterial spasm or by arterio-sclerotic changes, the cells will over-functionate in a spasmodic sort of manner, and we shall have plays of color (phosphenes) or scintillations, either colored or white, or scotoma like showers of sparks. If the visuo-psychic area which surrounds the visuo-optic, or the area for visual memories lying about the angular gyrus are independently affected or in combination, the visual resuscitations will be more elaborate and we shall find here the origin of the hallucinations of febrile, intoxication and mentally disturbed

conditions. Too little blood or blood containing a toxin or a poison will cause this pathological activity of the cortex, but it must not be forgotten that there are a myriad of causes which will congest these areas, and this is a prolific cause of the rhythmical showers of sparks and scotoma which come and go with the pulsations of the arteries. These disturbances of visual perception may arise from irritation all the way from the cortex to the retina, but a cortical localization is probable if the disturbances are bilateral, as in the tracts or retina they tend to be unilateral. *Muscae volitantes* are usually due to a hyper-sensitive visual apparatus which takes notice of normal opacities, exudates and other deposits floating in the vitreous. Phosphenes may or may not depend upon organic disease of the eye, glaucoma, for instance. They may also be produced by affection of the optic nerve, by irritations of the tracts, external geniculate body, the cuneus, as said before, or by disease of the brain causing increased intracranial pressure. When the layer of rods and cones and the axis cylinders of the optic nerve and retina are irritated by toxic substances or by an increase in the pressure of the blood or by external pressure, the field of vision will be occupied by brilliant meteoric displays of flashes and circles of light, bright or colored rings, or waves of light rapidly passing from one side to the other, or emanating from the center and spreading to the periphery, startling and real while they last.

To sum up: *Hallucination of Vision* when due to ocular disease may arise from, first:

1. Errors of refraction; 2, ocular defects; 3, opacities of the dioptric media; 4, change in the choroid, retina, and optic nerve.

Secondly: may arise from localized disturbance of cerebral circulation.

Thirdly: from organic disease of the cortical centers.

Colored vision is generally due to the absorption of pigments; which either change the dioptric media or produce some unknown change in the appreciative power of the retina.

Choked disc is the condition where the optic nerve as it appears in the retina has lost its perfect transparency, so that the clear-cut circular aperture in the choroid is lost, and one would think that a chrysanthemum was blooming out on the retina. The coverings of the optic nerve are made up from the dura and the pia blending into a sheath. If intracranial pressure is increased, the venous return from

the eye is retarded, congestion ensues and the nerve becomes edematous and the fibres opaque, but more than this; in meningitis without much increase in pressure the same condition will develop but with this difference, from the pressure of tumors in the cranium (the commonest cause) we find double choked disc, while from meningitis it is generally single. The probable cause of choked disc is a combination of retardation of venous return from the globe of the eye and direct infection of the axis cylinders of the optic nerve, all together producing congestion and edema of the nerve.

616 Madison Ave.

Echinacea is a remedy par excellence in general streptococcic infection.

Hepar works better when staphylococcus is the causative germ.

That the tonsils were responsible for troubles in other parts of the body has too often been a conclusion based upon inference rather than upon actual demonstration.—Sanger, *J. O. and O. L.*, Jan.—*J. L. M.*

ON THE DENTAL ORIGIN OF CERTAIN OCULAR DISEASES.

A. E. IBERSHOFF, M. D.,

Cleveland, Ohio.

SINCE the publication of my two previous reports, entitled "Carious Teeth as a Factor in Ocular Disease," JOURNAL OF OPHTHALMOLOGY AND OTO-LARYNGOLOGY, May, 1915, and "Ocular Disease of Dental Origin," same, July, 1915, a number of remarkably instructive cases have come under my care. These cases are reported herewith in support of the facts and theories set forth in the reports mentioned, and to give an estimate of the range, tractability and responsiveness of the morbid ocular conditions traceable to the oral cavity. My observations on this subject during the past two years have led me to conclude that the importance of oral infections in the causation of ocular disease has never been fully recognized or sufficiently emphasized. Especially in certain insidious, chronic, resistant and more or less masked morbid processes of the inner ocular structures will the cause and cure often be found to be a carious tooth or infected root canal. I have been so impressed by what I have observed that I have included an inspection of the oral cavity in the routine of every ocular examination. A goodly percentage of such patients are promptly referred to the dentist for work which is essentially prophylactic, while in others it constitutes practically the only treatment prescribed.

The majority of my cases can be classed under the name uveitis, more definitely as sub-acute and chronic serous cyclitis with the formation of exudates on the posterior layer of the cornea, in the aqueous and vitreous. These cases have almost without exception been of long standing, mild in character, devoid of pain or other manifestations associated with acute inflammatory processes and have involved the iris but little or not at all. The choroid, retina and optic nerve also showed fewer anatomical changes than might be expected. Vision was in all cases seriously interfered with, principally by reason of the presence of exudates in the form of dots or pigment granules on the

cornea, shreds or larger masses either freely movable or attached to the lens capsule, or finally in the form of diffuse clouding of the aqueous or vitreous. Only two cases showed any symptoms of external disease, and in both of these the lesions were those of a phlyctenular keratitis. With the exception of the single case of lenticular opacity all of the eleven cases reported responded with a marked improvement in vision varying from one-half to full normal.

The following added cases are in most respects similar to those previously reported:

CASE 6.—Mrs. C. H. F., æt. 40, complains of floating spots and pain in the eyes following close work. She adds that one of her teeth has annoyed her greatly, and that the eyes seem to be directly affected by it, the eye pain being brought on or aggravated by the irritation of the tooth. The patient's general health was good in every particular. Vision in the right eye, 20-50, was brought up to normal with $+ .50$ \ominus — 1.50 Cyl. Ax. 100° . Left eye showed a slight hyperopic astigmatism. Ocular muscles balanced; media clear; fundus normal.

Oral examination demonstrated marked pyorrhea alveolaris with pronounced recession of gums, especially of incisors and right superior second molar. The latter showed a central cavity communicating with the antrum and one root entirely destroyed. This was obviously the offender above mentioned. No pain could be elicited in the supra-orbital region or over the antrum. She was referred to the dentist with instructions to have the tooth removed and the pyorrhea treated. The eye pain disappeared as soon as the carious tooth was removed.

One year later a slight blepharitis induced me to make a change in her right lens. She reported having had a recurrence of the floating spots and some trouble with another molar which had since been extracted with complete relief of this symptom.

CASE 7.—Mrs. F. H. S., æt. 50, complains of occasional temporary diplopia with floating spots before the eyes especially in bright light. Vision not clear. Patient is of a very robust habit with florid complexion, and states she has always been in excellent health. Stomach and bowels good, menstrual function undiminished, no headaches or nervous disturbances. Vision in right eye 20-80, and in left eye 20-50. Compound plus lenses give slight improvement. Maddox test shows 1° exophoria and $1-2^{\circ}$ right hyperphoria at 20 feet.

Ophthalmoscopic examination disclosed much serous exudate on

lens capsule of right eye and incipient cataract. Only a hazy view of the fundus could be obtained. In the left eye a similar exudate was noted, but less extensive and limited to the infero-temporal quadrant. Fundus normal.

Oral examination: Gums retracted and bleeding; large accretions of tartar and food residue. The generally unkempt condition of the teeth was out of accord with the patient's intelligence. Questioned as to the cause of the neglect she answered that she never brushed her teeth because of the pain and bleeding of the gums which followed. Advanced pyorrhea above and below, a few cavities and some defective bridge work left no doubt in my mind that I had found the locus of infection. She was sent first to a specialist in pyorrhea, then to a dentist for prosthetic work. Temporary lenses were prescribed.

August 9. The left eye showed an appreciable improvement in vision, right eye no change. A vigorous bowel regimen and iodide of potash were added to the treatment.

The patient was not seen again until June 23, 1916. Examination showed complete absorption of the exudate in the right eye, but a compensatory development of the cataract prevented any improvement in vision. In the left eye only faint traces of the obstructive deposits remained. With a correction for astigmia this eye showed visual acuity of 20-30. Lenses were prescribed for reading.

CASE 8.—J. D., æt. 7, January 24, 1916, complains of severe pain in right eye with photophobia and lachrymation.

Examination showed presence of a phlyctenular kerato-conjunctivitis with a broken down phlyctenule at temporal border of cornea. Inquiry into the boy's habits elicited the fact that he had been an inordinate consumer of candy and sweetmeats. A glance at the mouth showed a double row of decayed stumps, the carious remnants of his milk teeth. The destruction was so great that, had they been permanent teeth instead, not one could have been repaired and retained with any promise of success. The patient was at once referred to the extractor who removed fourteen of the offenders, retaining only two incisors. Atropin, Yellow Oxide of Mercury Ointment and regulation of the diet with a total elimination of all sweets constituted the treatment outlined. Four days later the patient reported. The eye condition showed a remarkable improvement which progressed to complete recovery in ten days.

CASE 9.—Mrs. W. M. A., referred by Dr. J. A. Lytle, April 24, 1916, complains of sudden blurring of the left eye for past three days. No pain, but eyeball tender to touch. Patient has been under treatment for past year on account of general breakdown in health. Gives a history of repeated attacks of tonsillitis and sore throat during childhood with gradual amelioration in recent years. Her general health has been much improved by careful treatment and her weight increased ten pounds. Inquiry elicits the symptoms of swelling of the hands and feet and frequent passage of large quantities of pale urine. Loss of sense of smell and taste for past three years. Visual acuity in affected eye 20-120, in good eye normal. Ophthalmoscopic examination discloses fine punctate deposits on Descemet's membrane. Lens and vitreous clear. Fundus shows large white area above and on the temporal side of the optic disc. No pigment deposits present and border not sharply defined but fades into surrounding retina. Considerable edema, retinal vessels dip into and fade away in edematous area. Small punctate hemorrhages. Inferior retinal vein much engorged. Disc outline obliterated. Large white area referred to undoubtedly represents an absorbed hemorrhage. Patient on questioning gives history of a violent attack of nausea and vomiting incident to an attack of acute gastritis several weeks previous.

Blood pressure 120 mm.; Wassermann test negative. Urinalysis (Dr. C. L. Cummer) shows, sp. gr. 1025, reaction acid, albumin faintest possible trace, sugar none. Perimetric chart shows extremely contracted field for white, irregular field remnant for blue and red and total loss of perception for green in affected eye. Good eye shows contracted field for white and irregular overlapping color fields with partial inversion.

Examination of the nose demonstrated a slight septal spur on right side, not obstructive, and turgescient inferior turbinate on left side, breathing free, drainage good, no sinus disease.

May 8. Descemet's membrane shows distinct increase in deposits which appear not unlike a sprinkling of paprika. Questioned as to her teeth patient insisted they were in good condition, having received attention of her dentist a few weeks previous. However, I discovered a loose crown which required attention, and inasmuch as all my attempts to determine the etiology in the case had so far failed and the oral cavity had not yet been eliminated from the list of possible factors,

I directed her to the Roentgenologist who, on May 12th, submitted the following report: "Upon the upper right side I find what I take to be apical alveolar abscesses over the crowned second bicuspid and the crowned first molar, the mesio-buccal root of the molar being the one most involved. The upper left molar has, in my opinion, a pulp nodule. The space from which the first upper left molar has been extracted has a root remnant remaining. The lower left first molar, bearing a gold crown, shows bad root canal fillings and a blind abscess about the mesial root apex as a natural consequence. The upper right lateral incisor has a very good root canal filling, and I think is not to be regarded as a probable cause of secondary infection. The gravity of the case is such that I think the patient could well afford to part with the abscessed teeth with a hope that they might prove to have been foci of infection causing the lesion in the eye."

The patient at this time showed a distinct cloudiness of the vitreous which greatly obscured a view of the fundus. Dionin (5%), hot fomentations and iodide of potash constituted the treatment outlined with recommendation that the three offending teeth be extracted. This was done on the following day.

May 31. Patient reports sight much better. Test shows visual acuity improved from 20-120 to 20-50. Some cloudiness of vitreous remains but Descemet's deposits almost entirely absorbed. Patient's general condition has taken a marked turn for the better with a decided increase in weight. Patient still under observation.

CASE 10.—This case is one of the chronic, long-lasting, inflammatory type, which had been under the care of three capable oculists in another city for more than a year. Mrs. A. F. F., of Niles, Ohio, was referred by Dr. Paden, May 21st, 1916. She gave a history of having had a "stye" on the left eye a year previous. Though promptly treated, the inflammation did not subside for several months. It was followed by pain, soreness, congestion, photophobia, scratching and reduced vision. Her refraction was taken repeatedly and each time new lenses were prescribed. Topical and general treatment were carried out to no avail. At the time the patient was first seen she presented a picture not unlike that of a severe "scrofulous" kerato-conjunctivitis—lids sore and congested and squeezed together to avoid the light in spite of her dark glasses; vision very hazy so that she was unable to recognize anyone across the room; complexion mottled with eczematous eruption

about the chin and mouth. Blepharitis, lashes glued together and lids so adhered each morning to require prolonged bathing with hot water to separate them. The lower half of each cornea rough and filmy but showing no vessel formation. Left eye showed two phlyctenules near the center of the cornea. Some circum-corneal injection. Patient had recently had a miscarriage. She appeared poorly nourished, complained of malaise, anorexia, aprosexia, chronic constipation and perverted appetite by way of an inordinate desire for sweets. She had had a "dental examination" one year previous.

I made a provisional diagnosis of keratitis eczematosa and ordered a Wassermann and urinalysis at once. Vision in O. D., C. F. 15 ft.; in O. S., 20-200, no improvement with lenses. Prescribed Dionin (5%) t. i. d., ordered a rigid diet with avoidance of all sweets, pastries and rich foods, prescribed mineral oil to relieve the bowel stasis, hot fomentations and Yellow Oxide Ointment locally.

May 24. Wassermann negative. Urinalysis, sp. gr. 1020, acid reaction, no albumin, no sugar. Fundus examination was rendered impossible by diffuse cloudiness of aqueous and vitreous.

May 28. Bowels responded nicely to treatment. Eyes somewhat less congested. Ordered No. 2 smoke lenses. The patient was then referred to Dr. P. O. Parsons for dental examination. He reported seven cavities. Skiagraphs showed three last molars impacted. These were at once extracted. To accomplish this it was found necessary to burr off considerable of the jaw bone, each of the offending teeth showing a barb-like hook at the lower root extremity. Repair of the carious teeth was begun a few days later. Syr. Iron, Quinine and Strychnia added to treatment.

June 5. Eyes show considerable improvement. Patient complains of excessively hard stools despite the use of mineral oil. Agar was, therefore, prescribed, a tablespoonful with the morning meal and bran bread instead of wheat. Opened small pus pocket on lower lid, left eye. Vision O. D., 20-50?; O. S., 20-60?.

June 12. Patient very much improved. Lid congestion entirely disappeared, no photophobia, right cornea almost clear, left cornea decidedly improved. The patient came in smiling and volunteered the information that her vision was better than it had been for over a year. O. D. now 20-30??? with + .75 Cyl. Ax. 30° = 20-30. O. S., 20-50?

with $+ .75$ Cyl. Ax. $160^\circ = 20-30$. This correction was ordered in No. 2 smoke.

Skin eruption on the chin remains unchanged. Prescribed white precipitate in olive oil locally.

June 19. Dr. Parsons reports finding a piece of a dental curette in the root canal of one of the offending teeth from which the nerve had been removed. Efforts to remove the metal so far unsuccessful. Right eye perfectly clear so that medication was stopped. Left eye shows only faint corneal maculæ. Medication reduced. Patient's weight had increased eight pounds; appetite good, bowels regular. The results in this case have obviously been most gratifying to both patient and dentist.

On July 7th all medication was stopped.

August 15th the patient reported for final refraction. She looks ten years younger, all signs of facial eruption have disappeared. She was given permanent correcting lenses in Crookes' glass with binocular vision slightly less than 20-20.

CASE II.—F. C. R., May 20, 1916, complains that for three or four years he has suffered recurring attacks of severe congestion of the eyes with deep-seated pain. At the time of this visit the left eye showed a severe conjunctivitis with deep brick-red injection and considerable secretion. These attacks come and go without any assignable cause, attacking first one, then the other eye or both. Patient had been under one oculist's care nine months and under another's three months. Both had made a refraction test and prescribed Crookes' lenses without relief of the attacks. The patient is a man of refinement and feels keenly the handicap incident to these inflammations. He had recently undergone a thorough physical examination at the hands of an able internist without tangible results. He had had the services of Dr. H. C. Kenyon who had skiagraphed his teeth and cleansed several infected root canals. Tonsils healthy, patient's habits good, does not smoke or drink. Nasal cavity in good condition. Urinalysis negative; no history of venereal disease. Sinus transillumination negative. Ophthalmoscopic examination shows media clear; fundus normal.

- Deep physiological cupping of disc. Tension by tonometer O. D. 14 mm.; O. S. 15 mm. Extra ocular muscles balance. Sluggish accommodation.

Refractive test: O. D. 20-20?? with $+ .25 \text{ } \ominus + .25$ Cyl. Ax. 170°

= 20-20. O. S. 20-20?? with $+ .25 \text{ C} + .25 \text{ Cyl. Ax. } 10^\circ = 20-20$.
Prescribed this correction in dark Crookes' glass.

June 7. Dr. Kenyon reports opening an infected pulp canal and apical abscess of the lower right second bicuspid and advised extraction of the upper right second bicuspid.

About the middle of July there was a slight attack of pain with a little congestion of brief duration. When another mild attack followed in August the patient confessed that the condemned tooth had not yet been extracted owing to his absence from the city. His very great improvement bespeaks, to my thinking, a complete recovery from what has been a most unusual and obscure malady.

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THE LANGUAGE OF THE DISC.*

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Indianapolis, Ind.

TO the uninitiated the optic disc is a large round spot situated on the fundus of the eye, a little to the nasal side of the mechanical centre, with some blood vessels resembling angle worms emerging from it and crawling away over the landscape. Simply this and nothing more. And to the tyro in fundus examination it is little short of marvelous how the experienced oculist with his ophthalmoscope glued to his eye reads off a great number of interesting and important signs which he sees there as plainly as though it were written. It astonishes and bewilders him how the older man apparently reads off things which are as yet a sealed book to him. How it speaks to him through its color, its size, its shape, the appearance of its blood vessels, their size and whether tortuous or not, whether engorged or depleted, and what this means from a diagnostic and prognostic point of view. How he reads something of vast importance from the blurring of the edges of the disc, and whether it is swollen and projecting itself into the eye or excavated and apparently trying to escape from the eye. How he sees things written there about the scleral and choroidal rings and other unusual and important structural changes in and around the disc and can tell whether they are congenital or acquired, physiological or pathological; diagnostic or prognostic of grave import to our patient, or of little value in either sense. I can well remember the depressing realization of my shortcomings and of the tremendous possibilities of fundus examinations. How I was appalled at the immense number and variety and importance of the things this little spot on the fundus could tell to one who knew its language; and how I almost despaired of ever acquiring any such skill myself. But patience and perseverance has rendered its language more or less intelligible to me, and I will endeavor to read a few pages from this fascinating book for our mutual advantage. I can not hope to tell you anything new or startling, but trust that this little

*Candidate's Thesis for O., O. and L. Society.

review may do some one as much good in the reading as it did me in the writing.

Looking at a great number of discs we see that not all of them are round as our anatomy said they should be, but that many of them are more or less elongated in one axis. This tells in its own peculiar language that we have here an astigmatia of either the cornea or lens or both. Further, we read that the disc is not really oblong but is made to appear so by the rays of light passing through the astigmatic cornea or lens causing some of its rays to be deflected from the normal course while others are refracted in the normal manner, thus distorting the image of the disc and making it appear oblong. It is true that there are some ovoid discs, but they are rare and can be easily differentiated from the astigmatic disc by using a convex lens and withdrawing it a little way from the eye. If the disc appears to change its shape you can be sure you have a case of astigmatia and not an ovoid disc. The direction of greatest obliquity is the angle of the astigmatia.

Along side of the next disc and more to the temporal than to the nasal side lies a white band of varying width. We notice further that the disc itself looks small and the blood vessels are reduced in calibre, but on approaching the lens nearer the patient's eye, both disc and blood vessels get larger. This tells us that we have a posterior staphyloma due to myopia. And reading deeper it tells us that this appearance is due to the stretching of the sclera from the elongation of the eye, and as the choroid does not stretch it exposes the white sclera. It occurs more on the temporal side than the nasal because the greatest pressure being exerted upon the mechanical centre of the eye and the disc being to the nasal side the stretching would naturally occur upon the temporal side of the disc.

In the next fundus we see an anomaly known as a coloboma of the optic nerve. It is a rare congenital defect caused by the failure of the fetal cleft to close. It is generally irregularly round and is of very much the same color as the disc, though usually a little whiter. It lies usually on the lower side of the disc, thereby differentiating it from the disc itself, and the blood vessels emerging from the true disc calls attention to it. It is always excavated, as much as six dioptries being observed in a case reported by Randall. They are very rare, only about fifty cases being recorded in medical literature.

The next discs tell us about the different varieties of cupped discs.

The first one shows a funnel shaped depression, with its greatest depth at the centre of the disc and gradually sloping up to the circumference. And the blood vessels emerging from the centre are so gradual in their ascent that you can hardly perceive that they are changing their level. This is the physiological cupping caused by the divergence of the nerve fibres from the centre of the nerve head on entering the eye and spreading out over the surrounding retina and, as its name implies, is of no pathological significance.

But the next disc speaks a very different message. It is pale or even white, and this large white disc appears to hang in the red retina like a full moon in a harvest sky. It is also hollowed out and excavated, but it is a broad saucer-shaped depression extending practically all over the disc. The blood vessels show a decided kink where they rise from the lower level of the excavated disc onto the higher level of the retina. In the depth of this excavation may be seen some small dark dots which we recognize as the openings in the lamina cribrosa. The blood vessels are smaller than normal, and in advanced cases look like mere threads. This picture spells as plain as can be an atrophic cupping, such as is usually present in atrophy of the optic nerve from syphilis, disseminate sclerosis and tabes dorsalis.

And now we come to the worst of them all. It is called glaucomatous cupping, and its name implies its sinister import. It is broad and flat like the preceding one only much deeper and extends further outward. In fact, the excavation pushes to the very limit of the nerve sometimes and apparently the choroid overlaps it. In the atrophic form the excavation has not pushed so far that you lose sight of the blood vessels as they climb up onto the retina, but enough of the circumference of the nerve has been retained for us to follow them. In this form, however, the destruction is so complete that they apparently disappear under the overhanging choroid, and we lose sight of them, and later, they emerge with a decided backward kink and proceed on their way over the retina. Or tracing them the other way, they come up to the edge of the excavation and dip down a little and then curl right back under the edge of the choroid. This form of cupping occurs in the advanced cases of glaucoma, and is needless to add a symptom pregnant with disaster. The atrophic form of cupping is associated with diseases which if eradicated will exert a beneficial effect on the eye symptoms. But the glaucomatous form unless dis-

covered early and prompt and efficient surgical measures taken for its relief, means loss of sight and possibly of the eye itself.

Turning for a minute from these dark and depressing conditions to one a little brighter, we notice the next disc looks like a kaleidoscope. It is filled with a mass of bright, scintillating, glittering bodies which dance and sparkle and flash and twinkle in the light of our ophthalmoscope. And this spells hyalin bodies in the optic disc. This condition is often found in eyes otherwise normal, but is frequently associated with more serious diseases, such as retinitis pigmentosa, chorio-retinitis or retinitis albuminurica. These bodies collect in a mass on the nerve head and are not transparent but translucent. They, therefore, cause some diminution of vision, producing a cloudiness or veil-like vision, depending upon their amount, their position and the stage of their development.

In the next disc we see another congenital anomaly, viz., opaque or medullated nerve fibres. While not strictly a disease of the disc it is contiguous with it, and is, therefore, considered in this connection. The nerve fibres in the body of the nerve before passing out onto the retina are all covered by a medullary sheath which they normally lose at this point and thus become perfectly transparent. But in these cases nature has made one of her numerous slips, and in some way this particular bundle of nerves has retained its sheath for a varying distance onto the retina. This sheath being opaque renders them visible to the examining eye. Or in some cases they lose their sheath in a normal way for some distance from the disc and then for a short distance retain it again, but this form is very rare. They appear as an irregular shaped patch of varying size extending from any side of the disc for several millimetres and ending with a flame-like appearance or feathery edge at the point where their sheaths are lost. They are a dull white and are opaque. They do not often affect vision and are usually discovered while examining for something else.

Now here is something which hardly looks like a disc, but it is where a disc ought to be, as we can tell by the blood vessels converging at this point. Looking carefully we see that it is indeed the disc, but so swollen and disfigured that we can hardly recognize it. Its edges are so indistinct that we can not tell where the disc margin is and where the retina begins. The color, too, is so dark that it is almost the same as the retina thus rendering it more difficult to distinguish

the outlines of the disc. It is so swollen that it projects into the eye frequently several diopters. The vessels do not emerge from this mass in their usual and normal manner but are distorted and twisted, showing here and there and being lost again before being finally visible in their normal situations upon the retina. In the swollen disc they look like big fat "grub worms," while in the retina they are as long as normal, tortuous and tense looking, resembling nothing so much as a good old fashioned James Whitcomb Riley "fish bait." They also show a decided curve on "dip" where they drop down from the swollen disc onto the lower level of the retina. This is the inflammatory type of papillitis as seen in meningitis, the early stages of descending neuritis, rheumatism and syphilis. Of course, all cases do not present such an extreme picture, but may vary anywhere from a mere blurring of the edge and a general haziness, as in nicotine and alcohol amblyopias, to an appearance such as I have described. I saw a case in Dr. Shepard's clinic that resembled a large ripe strawberry with some short, fat, black worms in it. In this inflammatory type the vision is usually lost entirely.

There is another non-inflammatory form of this disease known as "choked disc," which is associated with the more chronic morbid processes in the brain, in which nearly or quite normal vision persists. In this form the disc, while greatly swollen, is of a dull grayish color, the edges are quite distinct in contradistinction to the red disc with its blurred edges. The arteries are quite small and the veins, while larger than normal, lack the enormous distention and tortuosity of the inflammatory type. All the blood vessels show, as in the other form, a decided "dip" where they leave the disc. Sometimes you can see an interruption of their course where the vessel dips under the swollen papilla. The principal etiological factors in producing this condition are, in the order of their frequency, brain tumor, brain abscess, hydrocephalus, tubercular meningitis and otitic processes.

The blood vessels are a prolific source of knowledge. Sometimes the veins are large and tortuous, as I have had occasion to mention, and then it whispers to us of some pressure upon the vessels within the nerve trunks, as in retro-bulbar neuritis, where the swelling of the nerve within the sheath causes an impingement of the blood vessels preventing the blood from entering the eye, hence the small arteries, and preventing it from getting out through the veins, hence the large,

swollen and turgid vein. Again, there may be a thrombosis of the central vein, shutting off the escape of blood from the retina, hence the tremendously swollen veins and the general hemorrhagic condition of the whole retina. Or we may have an embolism of the central artery, and then we have the opposite condition, viz., very small thread-like arteries, the veins reduced also but not so much, the whole retina pale and bloodless, or in case it only affects one of the branches that portion of the retina supplied by that branch is blanched, and in the case of a plugging of the central artery we have the so-called "cherry red spot" more or less distinct.

In nearly all of these conditions that I have mentioned the appearance of the disc is not sufficient for a positive diagnosis without some confirmatory symptom in other parts of the eye, but they are in all instances strongly suggestive. In other words, they do not always speak in clarion tones, but in many instances they are only an insistent whisper, directing our attention in the direction we should look for further light on our case. Nor is it always necessary that its language should be a shout, but how many times in a difficult or obscure case we are glad to have a sign which whispers something that will put us on the right track. There are, of course, many more things we could learn from a study of the disc, but I think I have given enough to show the tremendous importance from a diagnostic and prognostic point of view of a careful and painstaking examination of every disc we see, that we may the more thoroughly familiarize ourselves with its appearance, anomalies and pathology and thus be better qualified to read correctly "The Language of the Disc."

The Pennway.

CATARRHAL DISEASES OF THE NASO-PHARYNX.

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SOMETHING that everybody has is likely to be regarded as so commonplace that little attention is paid to it, even though it may be of vital importance.

The patient says to his family physician, "Doctor, I guess everybody has more or less catarrh of the nose and throat in this climate?" In the majority of instances the answer will likely be, "Yes, it is almost impossible to avoid it in a climate like ours."

"Can it be cured, doctor?" the patient may ask. "It may be relieved but seldom cured," will be the answer in most cases.

I know I have not exaggerated in the above quotation. In my years of general practice I have gone through with the same or a similar dialogue many times, and have heard the same opinion expressed by many other physicians, both in private conversation and in medical meetings.

This is in no way meant to be a criticism of the general practitioner, for the opinion expressed above regarding catarrhal diseases of the naso-pharynx is pretty generally adhered to by the general medical man. The whole subject of medicine is a big one and when it comes to special subjects outside of our own hobby, we are apt to pass them up with some casual remark and let it go at that. This is especially true of nasal catarrh, because as I said in the beginning it is such a common ailment. We are more inclined to give attention to the so-called "big" and "scientific" medical subjects such as, for instance, "Endocarditis of the 'pulmonic valve, caused by micrococcus endocarditidis rugatus;" "Herpes zoster of the cephalic extremity with special reference to the geniculate, auditory, glossopharyngeal and vagal syndromes;" "Generalized telangiectasia in association with lues, with the pathological picture of peripheral vascular sclerosis." All of which and several others of similar sound appeared in a recent issue of an ultra-scientific medical journal. They sound *great*, but these subjects are not one-tenth as important as the ever-present common-

place subject of naso-pharyngeal catarrh, for the reason that it is so prevalent and is at the very bottom as a causative factor in so many of our serious diseases, among which might be the above first mentioned "big" medical subject.

A great medical man said more than one hundred years ago, "In treating disease first remove the cause." How logical and true to-day the same as when first uttered.

Naso-pharyngeal catarrh is the direct or indirect cause of half our ills. This being true it is worthy of our most serious consideration.

For some unknown reason the laity regards a common cold as of little significance. Many doctors take the same view of the subject. For this reason most colds are neglected or improperly treated. Little attention is paid to this old fashioned ailment, which everybody has at one time or another, unless complications develop. Especially in the infant are we inclined to look upon a slight cold as a matter of course. "It will amount to nothing serious," the doctor may even say, and frequently it is allowed to pursue its course unmolested. As a result the baby's first cold is often prolonged and the second attack is easier to contract, and soon we have a baby that "catches cold so easily." These repeated colds set up a marked activity of the lymphoid elements of the mucous membranes lining the naso-pharyngeal passages and soon we have a child with a stuffy nose due to hyperplasia of the tissues of the naso-pharynx. Here we have the beginning of adenoids and hypertrophied tonsils, enlarged turbinates, etc. In consequence we have a mouth breather and all the defects of mouth and nose which follow. We have the beginning of ethmoiditis, frontal and maxillary sinusitis and less frequently sphenoidal involvement, and all the dangerous possible complications which may follow. The foundation has been laid for the systematic absorption of toxins and the following of secondary diseases as rheumatism, endocarditis, perhaps appendicitis or poliomyelitis and various other infections which we are at a loss to explain "why or how it happened."

The child is made more susceptible to diseases, especially those which are carried by the air as the germs of these diseases find their first lodging place in the nose or mouth, and the membranes of these cavities being of lowered resistance the bacteria multiply rapidly upon this fertile soil and are soon able to build up their recruiting armies for a successful offensive campaign. The histologic lining of the naso-

pharynx is largely squamous epithelium—not ciliated—and hence the germs of disease congregate rapidly and are thus able to concentrate their forces in this field. So we know what must be the inevitable result.

I thoroughly believe that if the naso-pharyngeal passages of all persons were in an absolutely healthy condition, *i. e.*, the passages free and normal, the post-nasal space clear of adenoid tissue, hypertrophied and diseased tonsils removed, that we would much less frequently hear of measles, scarlet fever, diphtheria, etc. Close observation will disclose the fact that most persons who develop the above named diseases either have a sub-acute or chronic nasal, or pharyngeal catarrh, an excess of adenoid tissue, or diseased or hypertrophied tonsils. Many of these patients have a chronic ethmoiditis or some affection of the other nasal sinuses. As a result of these diseased conditions in the nose and throat, these persons are an easy prey to the acute exanthemata and are more likely to suffer from the serious complications which frequently follow, among which are suppuration of the middle ear, which may be followed by an acute purulent mastoiditis. We may also have a meningitis or a brain abscess, either by the mastoid route or through some of the accessory sinuses of the nose.

So far reaching and so many are the serious complications that may be the final result of what, in its incipency, seemed a very simple matter, that the subject is worthy of our most earnest attention.

As to the treatment of naso-pharyngeal catarrh: Much has been said and written about climate. It is quite true that some climates have a favorable action upon this trouble. However, but comparatively few people are so situated, for one reason or another, as to be able to go to another climate to get benefit from catarrhal troubles. The climate suitable to one case does not always favorably affect another case. So it is to a greater or less extent a matter of selecting a climate suited to each individual case. A very large percentage of cases will not be cured in any climate unless certain surgical measures are carried out with respect to obstructions, etc., in nose or throat. I believe that the majority of cases can be cured in the place where they now reside if proper treatment is instituted.

The first duty of the physician is to endeavor to prevent disease or to prevent a simple ailment from becoming a serious one. So the treatment of naso-pharyngeal catarrh should begin the moment the infant

shows signs of its first cold. If every cold were treated as though it were the most serious disease; if we would treat a common cold as religiously as a case of pneumonia or typhoid fever and treat it until the patient is *entirely well*, we would have comparatively few cases of catarrh of the naso-pharynx. Doctors should educate their patients to regard every common cold seriously and to seek medical aid at once.

I appreciate the fact that it is not an easy matter to get people into the habit of doing this because they do not think of a cold as an ailment of much consequence, and often do not consult a physician until they have exhausted their home remedies and the various patent preparations on the market without success. Persistent admonition and portrayal of the serious probable and possible complications which may follow a common cold will eventually get many people at least to see the importance of this matter.

But what shall we do with those cases which already have catarrh of the naso-pharynx, either because they have been neglected or have neglected themselves. Many of these cases are almost beyond help. Many of them have complications, such as deafness, etc., which is very difficult to even relieve. But a very large percentage of these cases can be cleaned up and cured. Yes, in a middle west climate. We must first find out the condition present and treat it accordingly. In children you will find the majority of them have adenoids, enlarged or diseased tonsils, and congested or hypertrophied turbinates. In such cases the first thing to do and without delay is to remove adenoids by surgical means, and to do it thoroughly. Many cases are only half removed. If the tonsils are hypertrophied or diseased they should be enucleated. A tonsillotomy will not suffice. The tonsils should be removed in their closed capsules and without injury to the surrounding structures. After this procedure, especially in children, the congested turbinates usually reduce in size and in a few weeks the child will be practically free from catarrh of the naso-pharynx. It will be necessary in some cases to follow the surgical measures with appropriate local treatment and the properly selected internal remedy. In adults you will find in the great majority of cases of naso-pharyngeal catarrh some defect in the nose—usually a deflected or deviated septum or an obstructing spur, or hyperplastic or hypertrophied turbinates, generally the middle, less frequently the inferior. You can spray and locally treat these conditions till doomsday and the best you will be

able to do is to give temporary relief. No cure can follow until *proper drainage* is established in the nose. This can only be done in most cases by surgical means. In cases of deviated or deflected septa a sub-mucous resection should be performed first. In many cases the enlarged turbinates will gradually reduce after this operation. If they do not sufficiently, a partial or complete removal of the offender may be necessary later. The object to be accomplished is *normal drainage*, for in the majority of these cases we find a chronic ethmoiditis which will not be cured until the pent up secretions can find a proper outlet, and these important cells receive their normal supply of oxygen through the medium of proper nasal inhalation. The nasal operations referred to may have to be in some cases supplemented by a partial or complete exenteration of the ethmoid cells—anterior or posterior—according to the condition. In the case of polypoid growths it is usually a waste of time to snare them off as has frequently been the custom. The radical method is the only one that promises permanent relief. This generally means a complete middle turbinectomy followed by thorough curettage of the ethmoid region. After this surgical procedure it is usually necessary to use some local treatment to help nature get the mucous membranes in a healthy condition. Alkaline sprays, normal saline douches, argyrol, silvol or cargentos tampons properly used will generally accomplish what you desire, as you have already established proper drainage.

A word as to the treatment of adenoids and hypertrophied tonsils by internal remedies or local measures. In some cases it can be done. Adenoid tissue will atrophy and disappear after a few years. But the damage has been done before this occurs, and often the damage is irreparable. The excess of adenoid tissue in conjunction with the nasal defects often caused by this tissue has laid the foundation for a more or less deaf patient in after years. It has produced a high arched palate as a result of mouth breathing—which means nostrils that will remain smaller than they normally should be. It helps to produce deviated septa, which, in turn, is partially responsible for many cases of ethmoiditis due to blocking of drainage. It causes the teeth to become out of line, thus making work for the orthodontist. By being a main factor in the production of nasal defects it may cause many reflex conditions, such as asthma, hay fever, headaches and various neuroses.

So while the adenoid tissue is gone it has left its marks, and the bad effects produced, remain.

The treatment by internal medicine may hasten the disappearance of adenoids and hypertrophied tonsils to some extent, but the process is so slow that much permanent damage is done before the tissue disappears. It does not pay to temporize with conditions that may produce such direful results if neglected. Prompt and positive treatment is to be preferred.

When physicians and parents fully appreciate the far reaching serious consequences of naso-pharyngeal catarrh; when we are able to promptly recognize the need for persistent treatment, whether it be preventive, medical or surgical; when we realize that this old fashioned, commonplace ailment—naso-pharyngeal catarrh—is not a trifling matter, but that it is the primary cause of many of our fatal diseases, then we will have accomplished an important epoch in preventive medicine.

Reibold Building.

TUBERCULOSIS OF THE NOSE, MOUTH AND THROAT.

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A STUDY of tubercular lesions of the upper respiratory tract and adjacent tissues of the alimentary tract is a very interesting subject. Like tuberculosis elsewhere, in these tissues, the onset is usually insidious and difficult of detection, frequently being overlooked, even when most careful and routine case taking is carried out. With improved methods of diagnosis we are discovering cases earlier, and necropsies show the presence of pulmonary lesions, latent or undiagnosed, complicating upper respiratory involvement. These two facts have led us to change our opinion materially as to the frequency of this condition.

Primary tubercular lesions of these structures are rare, and the percentage of secondary involvement in pulmonary and systemic tuberculosis is astonishingly high. Osler⁵ quotes Moeller and Rapaport in finding in pulmonary tuberculosis pathologic changes (tubercular) of nasal tissues in 34%, of pharyngeal tissues in 76%, and of laryngeal tissues in 42%. Other authorities coincide with this opinion.

In a consideration of predisposing factors and tubercular diatheses we have our attention directed to the symptomatic picture of chronic cervical lymphadenitis so common in school children. This condition is usually more marked in winter during school months when in crowded rooms there is exposure to the contagion of mild influenzas and common colds, and clears up during summer under better hygienic conditions. If this condition is not tubercular it may develop later upon the vulnerable soil through the lymphatic ring. Long standing cervical lymphadenitis should suggest tuberculosis. The importance of the tonsil as an open door to systemic infection must not be forgotten, and will be passed here with its mention. At the University of Michigan⁷, pathologic examination of enucleated tonsils cut twice across and sectioned twice, gave evidence of tuberculosis in the tonsil in 3% to 5% of general run of cases. Patients showing only moderate

cervical glandular involvement gave a much higher rate of tubercular findings. In active tubercular cases the rate was about 20%. Complete serial sections, of course, would show a proportionately higher rate.

Text books discuss this subject under two heads: Acute or tubercular lesions, and chronic or lupoid lesions. The paths of infection are exogenous, as direct local inoculation, and endogenous, as through the lymph and blood streams, a third perhaps might be differentiated, namely, direct extension.

Lupus of the nose may be considered an avirulent tubercular manifestation. It attacks most frequently the anterior septal or alar mucosa, and is characterized by a pathologic process of nodule formation followed by caseation and subsequent ulceration with healing cicatrix and frequent recurrence. The process of ulceration may involve the cartilage, but rarely osseous structures. Extensive ulceration sometimes spreads to the cutaneous alar and lip tissues and leaves its mark as a more or less noticeable cicatrix.

This condition is found most frequently in the country, and in females of middle life. The initial symptoms are so mild that the patient's attention is seldom called to it sufficiently as to warrant advice of a physician. Chronic lymphangitis of the alæ or tip should suggest lupus, especially if followed by a dermatitis of the vestibule. The nodules are difficult of demonstration unless very large, but ulceration with nodular periphery, slight discharge, attempt at healing with cicatrix, and recurrence in the presence of skin lupus will make the diagnosis sure. The condition is almost never primary. Unless the diagnosis is manifest, we think of syphilis which will be differentiated by Wassermann reaction or response to iodide treatment.

The prognosis is unfavorable so far as cure is concerned, but is quite amenable to treatment. Encroachment upon the nasal end of the lachrymal duct with consequent occlusion by cicatrization, or nasal dyspnea from marked vestibule contraction are the most unfavorable sequelæ. Discreet nodules may be excised, ulcers should be curetted and cauterized, and in the event of failure to control it by these methods, radiotherapy gives the best results. The following remedies should be studied. Ivins² and Jousset³ give excellent differential indications for: Alumina, Arsenicum Album, Aurum Muriaticum, Causticum, Hy-

drastis Canadensis, Iodine, Kali Bichromicum, Kreosotum, Sulphur and Thuja.

Tuberculosis of the nose is seldom primary. It attacks the same areas as lupus, but confines its action more to the mucous and cartilaginous tissues. The primary tubercle is seldom seen, and the attention of the patient is not always directed to the lesion even in ulceration unless quite extensive. A shallow ulcer surrounded by a nodular rim and a sluggish base covered by tenacious muco-purulent discharge, and painless, is the usual lesion found. Deep ulceration frequently involves the cartilage, and coexistent bilateral ulcers will result in septal perforation most likely. At the present time I have a patient in which the ulcer is far back upon the bony septum complicating chronic fibroid phthisis.

The diagnosis is never absolute until the tubercle bacillus is recovered from the lesion. The presence of pulmonary or systemic tuberculosis helps in verifying the diagnosis. The prognosis is generally grave because of tuberculosis elsewhere, and the treatment, therefore, is palliative. Aside from climate and diet hygiene the treatment will be similar to that of lupus, however local cleanliness is more important in active tubercular lesions and the case must be regarded as infectious. Lactic acid 20% to 100% is a valuable local agent, and in addition to the indicated remedy will render mild cases controllable. Reference will be made to the remedies under laryngeal tuberculosis.

Tuberculosis of the nasal accessory sinuses is rarely diagnosed before autopsy, and if found, the treatment is that of chronic suppurative sinusitis by very radical measures (Phillips⁶), and satisfactory results less liable to be obtained.

Lupus of the mouth and pharynx is rare and almost always secondary to skin lesions. The lesion here has the same characteristic pathology as in the nose with perhaps more extensive nodular formation and infiltration in the region of blood vessels. This makes it liable to be mistaken for syphilitic infiltration. The ulcer is anesthetic, there is no especial impairment of general health as in tuberculosis, cervical adenitis is not infrequent, and scar formation may produce dysphagia of varying degree. The treatment is the same as outlined for nasal lupus with more attention paid to local cleanliness of ulcers. Phillips⁶

recommends tuberculin injections. Ivins² gives indications for Bromine, Ignatia, Iodine, the Calcareas, Psorinum and Silicea.

Tuberculosis of the mouth and pharynx is seldom primary, except in the tonsil. In conditions of general impairment of health in pulmonary tuberculosis, the mucosa of the mouth and pharynx is a vulnerable field, and in open cases by virtue of the more or less constant bathing by tubercle laden sputa direct infection is frequent. The ulcer which is more spreading here may involve any of the mucosa, especially of low resistance as tonsillar crypts, abraded gums and faucial pillars. Tissue destruction is most marked over the palate and tonsil, the latter being sometimes almost wholly lost. On the tongue the ulcer is most frequent (Osler⁵), along the border or upon the top. Osler⁵ is authority for saying that salivary glands are infrequently involved, the parotid predominating.

The ulcer will be differentiated from syphilis by being more superficial and having a mouse-nibbled or worm-eaten appearance, burning pain and bleeding in extensive lesions. The ultimate test is the demonstration of the tubercle bacillus, and this will rule out Vincent's and other anginas. Impaired phonation from tissue destruction, reflex cough, hectic temperature and otherwise tubercular history help complete the picture of advanced stages.

The local treatment will be cleanliness by gargle and sprays, curettage and caustic applications. Painful deglutition may be relieved, especially during feeding, by cocain applications; Kyle⁴ claims good results from the use of pineapple juice slowly sipped. General care and therapeutic measures will already be instituted for the systemic involvement, which should include the indicated remedy.

Retropharyngeal abscess may have to be differentiated at times from tubercular abscess of the cervical vertebræ; there is rigidity of the spine in the latter, and bacterial findings will help decide the matter.

Lupus of the larynx is more rare than in the nose or mouth for secondary involvement here is less liable because of generally healthy laryngeal tissues in skin lupus, also because of the fact that discharges are carried away from rather than toward the larynx. The pathology is the same here as seen in the tissues before mentioned, but its results are more marked because of the nature and importance of the structures involved.

The symptoms complained of are hoarseness, aphonia when the

cords are involved, dyspnea from cicatricial formation, irritative cough, slight expectoration, and generally no pain. The laryngoscope will show nodular or ulcerated areas over the epiglottis and extension downward toward the arytenoid and cord areas. Cicatrices indicate the chronicity of the process and help to confirm the diagnosis. The prognosis is unfavorable for cure, it runs a chronic course and fatal termination within the time of obstructed respiration from contracting scars is kept in mind. The treatment will be constitutional, and removal of nodules providing that is possible with any degree of completeness. Ulcers may be controlled by the application of lactic acid. Tracheotomy is necessary at times in extreme dyspnea.

Tuberculosis of the larynx is a more serious consideration than any other of this paper. It is a question whether laryngeal tuberculosis is ever absolutely primary. The secondary cases are usually to be found in open pulmonary tuberculosis where irritated or abraded mucosa becomes inoculated by the bacillus in the sputa. In resistant mucosa, the infection may gain entrance through the ducts into lymph glands in the region of the arytenoids. Another route of infection is metastasis through the lymph and blood streams. Secondary involvement in the larynx is less frequent where the lesion is primary in the nose or tonsil because of the effective barrier of cervical lymphatics draining these areas. Ballenger¹ makes this a strong point in his discussion of etiology in laryngeal lesions. We look for pulmonary trouble, therefore, to explain most of the laryngeal cases. The reverse should also be true, namely, carefully watching the larynx in all pulmonary cases; especially is this important in pregnancy when latent lesions are liable to become manifest and progress rapidly to a fatal termination.

Laryngeal tuberculosis is most common between the ages of 20 and 30, and $2\frac{1}{2}$ times (Phillips⁶) as frequent in men as in women. The course of the disease is usually rapid and has a wide range of symptoms. The pathology is characterized by glandular and connective tissue infiltration and ulceration. The laryngoscope will show very early either a hyperemia or chronic anemia of the mucosa. As infiltration progresses the epiglottis has a turban shape due to border thickening, and the arytenoids develop a club or pear shape; the aryepiglottic fold is edematous. The tubercles are to be seen at times just under the mucosa as millet seed spots. The next step in the

retrograde change is necrosis of the tubercle from obstructed nutrition, and ulceration ensues which marks the beginning of the final stages. Ulcers may be uni- or bilateral, single, multiple or coalescent. They usually have a distinct outline in otherwise healthy mucosa, a dirty or ragged base, ropy secretion more marked when the cartilage sloughs.

The first symptoms complained of are likely to be dry cough, dry and burning sensation in the throat, progressive hoarseness, and weakened voice. After ulceration with exposure of nerve filaments there will be pain of more or less intensity. When the cords are involved a change in vocal pitch (lower) and timbre occurs. In late stages there is aphonia, dysphagia and regurgitation, painful cough, dyspnea, rapid debility and emaciation with hectic complex. If much expectoration, it probably is from the lungs, not enough destruction of laryngeal tissues is possible to produce excessive expectoration.

Lupus will be differentiated by its slow development, painless nodular lesions, and presence of skin lesions; syphilis by the history, rapid invasion with deep ulcers, and serum tests; mixed infection with syphilis is possible; malignancy by the early severe pain, granulomata and age.

Osler² under the heading of neuroses in tubercular patients, speaks of aphonia and occasional laryngeal spasm at the menstrual period, especially in nurses, and which he considers to be a functional paresis of the adductors of the cords from pressure upon the recurrent nerve by enlarged glands, apical infiltration, shrinking in pleurisy, etc.

The prognosis is guarded upon the basis of weeks or months of life extension for the patient. Few cases are cured. Very great general care is more important in laryngeal complications to pulmonary involvement. A climate of dry warm air where no sudden changes occur is to be secured, cold irritates too much. Local treatment of cleansing alkaline or formaldehyde sprays and the application of dilute nitric, hydrochloric or lactic acid often holds the condition in abeyance, providing the general condition is favorable. Deep sloughs should be curetted. For painful cough or swallowing a spray of weak cocaine solution is useful. Kyle⁴ relies much upon a spray of pineapple juice. Recent use of deep injections of alcohol into the terminal end of the recurrent laryngeal nerve has proved very satisfactory in painful late stages. The indicated remedy should be relied upon to assist whatever

other treatment is instituted. Ivins² and Jousset³ give the following as most frequently indicated: Argentum Nitricum, Arsenicum Album, Bromine, Drosera, Ferrum Phosphoricum, Hepar Sulfur, Iodin, Kali Carbonicum, Mercurius Nitrate, Manganum, Naja, Nitric Acid, Phosphorus, Silicea, Spongia and Stannum.

Contraindications for removal to other climate mentioned by Phillips⁶ are rapid emaciation, diarrhea, dysphagia, hemoptysis and dyspnea. Operation is contraindicated where there is an impossibility of removal of diseased parts, in active progressive or extensive lung lesions with wasting, frequent hemoptysis, in nervous debility, in feebleness and old age. The favorable cases to operate are those in which the infiltration is localized, or slight ulceration, and in relatively strong individuals, where the general disease is not rapid. In obstructive dyspnea, operation is always warranted. The operations considered are extensive internal curettage, or partial or complete laryngectomy.

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ATROPHIC RHINITIS, ITS ETIOLOGY AND TREATMENT.

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THE subject of the etiology of atrophic rhinitis has been worked on for years by different observers in various parts of the country. As is well known, the disease is more prevalent in Europe than it is in America.

For the purpose of this short paper I shall include under this title only those cases which show atrophy of the turbinates with crust formation and fetor. It has been shown over and over again that crust formation and atrophy, or at least a certain amount of atrophy without the fetor, may accompany lupus and syphilis of the nasal mucosa, or a similar condition may follow operations of the ethmoidal region for purulent sinusitis. The latter may be called secondary atrophic rhinitis. I will consider solely cases of primary atrophic rhinitis.

E. Fränkel in 1882 was the first to observe the close resemblance of atrophic rhinitis to tuberculosis. He records the fact that out of six post-mortem examinations made by him upon patients who died of atrophic rhinitis, five showed old or recent signs of pulmonary tuberculosis. In this same paper Fränkel drew attention to the clinical fact that "most patients with atrophic rhinitis show a certain amount of anemia, and, as a general rule, were poorly nourished."

Since Fränkel's paper, in 1882, post-mortem examinations by others have confirmed his findings. Alexander found in twenty-two post-mortems upon patients with atrophic rhinitis, fifteen, or sixty-eight per cent., were found to have died of pulmonary tuberculosis. If in addition to pulmonary tuberculosis we include other forms of tuberculosis with reference to the family history, we shall probably find the evidence of tuberculosis in cases of atrophic rhinitis to be greater than Alexander's sixty-eight per cent. Drs. Don McKenzie and John Mackeith at the Central London Throat and Ear Hospital observed a similar condition.

From the above the question arises, "Is atrophic rhinitis caused by

tuberculosis?" It is almost universally accepted nowadays that nasal disease predisposes to tuberculosis. Is it not natural to suppose when pulmonary tuberculosis is found in a patient with atrophic rhinitis that the lung disease is secondary to the atrophic rhinitis and due probably to the inspired air not being properly filtered, warmed and moistened? Many observers have sought for a specific organism with doubtful results. Considerable attention, however, has been paid to the Perez bacillus. Hoffer, of Vienna, writing in 1912, felt positive that the Perez bacillus is the true and only etiological factor in atrophic rhinitis. Wyatt Wingrave has discovered an acid-fast bacillus in every case of true atrophic rhinitis examined, but in no other diseases of the nose, and in some of them they have proven to be not only morphologically identical with the tubercular bacillus but were occasionally near alcohol fast and color true to the Ziehl-Neelson stain.

TREATMENT.

The treatment of atrophic rhinitis has been very unsatisfactory, but with proper vaccines, autogenous and mixed, and tuberculin, better results will be obtained. In a series of cases recently reported by Dr. Mackeith, of London, of thirteen cases treated with tuberculin, seven showed great improvement, three improvement, and two improvement followed by relapse, and one treatment was of no avail.

The writer has had seven cases of atrophic rhinitis under treatment the past two years, using autogenous vaccines, stock vaccines and tuberculin. Of these, three have shown great improvement, two moderate improvement, and two only improvement since they have had the tuberculin.

I give below the case histories:

CASE 1.—E. F., girl aged 16, parents dead; mother died of phthisis. Has had odor and discharge from nose since she was eight years. Typical atrophic rhinitis, large foul smelling crusts filling each nostril. Stock vaccine used, improvement from the first injections; odor gone, scarce any crusts. Patient says she is cured.

CASE 2.—M. H., woman 27, family history negative. Typical atrophic rhinitis since childhood, treated for years both here and in Europe; large green crusts over middle turbinates. Stock vaccines first used, followed by autogenous vaccines. Patient much pleased with the results of treatment.

CASE 3.—J. C., aged 8, complains of crusts and odor blocking nostrils. Examination of mother shows a similar condition. Used autogenous vaccine, about twelve injections at weekly intervals, with very satisfactory results; odor and crusts disappeared.

CASE 4.—M. C., woman aged 33, mother of previous case. Mother died of pulmonary tuberculosis ten years ago. Has had atrophic rhinitis ten or twelve years; large green crusts blocking both nostrils; very offensive odor. Autogenous vaccines used with only slight improvement. Tuberculin reaction positive. Since tuberculin used improvement very marked; odor gone; very few small crusts. Patient feels she is practically cured but is still under treatment.

CASE 5.—E. R., age 14. Family history negative. For three years large grey crusts, odor and some atrophy of ant. middle turbinates. Stock vaccine followed by autogenous vaccine has improved case very much.

CASE 6.—J. K., age 16. Family negative. For five or six years crusts and foul discharge from nose. Has been under treatment most of the time with little if any benefit. Autogenous vaccines used for several weeks; crusts small, thin and less odor. Patient says there is great improvement.

CASE 7.—H. D. E., aged 18, father died of tuberculosis when she was ten years of age. One sister died of phthisis four years ago. For six or seven years "catarrh." Examination shows large dark green crusts in both nostrils; foul odor; temperature 99.7°; chest examination negative. Tuberculin reaction positive. Tuberculin alone used in this case. Patient has gained eight pounds in past two months. Crust is now small and few in number; odor much improved. Says she feels better than for years. Still under treatment.

CONCLUSIONS.

1. In the majority of post-mortem examinations upon patients who had atrophic rhinitis tuberculosis was found to be present.
2. Atrophic rhinitis is probably a manifestation of tuberculosis.
3. All persons with atrophic rhinitis should be examined for tuberculosis.
4. As for the treatment of atrophic rhinitis, there is much to be expected from tuberculin, autogenous and stock vaccines, especially the former in cases of tuberculosis history or reaction to tuberculin.

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A CLINICAL CASE.

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ON June 12, 1915, a young lady, 19 years of age, came to me for loss of vision of the left eye especially.

On examination found vision: R. E. $8/200 - 5.50 = 2$ ax. $20 = 15/30$. L. E. $2/200$. Could not improve by glasses.

On using a mydriatic the R. E. $2/200 - 5.50 - 2$ ax. $20 = 15/20$. L. E. $2/200 - 3.50 - 1.50$ ax. $165 = 15/200$.

On examination with ophthalmoscope found the left vitreous filled with large floating opacities (a diagnosis of cataract had been made by another doctor); there were some few opacities floating in right eye. Could not see fundus of the left eye, but that of the right was normal. Gave her Kali Mur. 3x, and used Dionin, 5 per cent., locally, four times a day. On July 7th left vision had come up to $15/70$ with glasses. Kept her on Kali Mur. 3x and Dionin. Also gave in between some large and small doses of K. I., but with very little further improvement. On November 4th, as the vision remained the same, I gave her subconjunctival injection in left eye of ten drops of Cyanide of Mercury 1-6000. On December 9th left vision was $15/40$. On December 16th the left vision was $15/30$. All these tests were made with glasses. She had a second injection of the Cyanide at this time. The vision kept varying, and on January 27th, 1916, the left vision dropped to $15/70$.

Did not see patient again until March 29th, 1916, when the vision reversed itself, the R. V. $15/200$, L. V. $15/50$. At this time I gave an injection in the right eye of fifteen drops of the following solution: Cyanide Merc., 1-3000; Morphine, gr. $1/8$; Dionin, gr. $1/8$. This is recommended by Dr. Jones, but he gives, 2 c. c.. I was afraid to use 2 c. c.; the reaction was very severe as it was, but outside of the pain and producing an intense swelling of conjunctiva of eyeball and lids, it caused no trouble. I had the patient use ice application on the eye; the eye was thoroughly cocainized before using the injection. On seeing her on April 21st, R. V. $15/70$, L. V. $14/40$. I did not see her

again, and in the interval had been under no treatment until July 28th, when her vision was R. V. 15/30, L. V. 15/40. On examining the eyes with the ophthalmoscope the vitreous was a little hazy, but the opacities had disappeared; there were no pathological changes in the fundus. The injections appeared to me to break up those large opacities into smaller ones and fine cloud-like substance which were absorbed.

At the beginning of treatment of this case she was having treatment two or three times a week by the galvanic current, X-ray flash and the high frequency, with apparently no benefit. Whether this condition will return I cannot say, but if it does, I will use the injections again.

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A CASE OF PUERPERAL METASTATIC SUPPURATIVE CHOROIDITIS.

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New York.

THE patient, a young married woman, entered the Metropolitan Hospital, having been delivered of a dead child the day before. She had a history of an old pelvic abscess which had been operated upon, whether before pregnancy, I can not say. Her eyes became inflamed the same day that she was delivered of the dead child. When I saw her she was running a temperature with all the other symptoms of puerperal fever, and was so diagnosed by the attending physician. When first seen by me the eyelids were swollen, conjunctiva red and chemosed, cornea commencing to be hazy, anterior chamber very deep, iris drawn back, pupil contracted, and aqueous humor becoming cloudy. At that visit I made the diagnosis of metastatic irido-choroiditis. Examination of blood showed the presence of streptococci; the discharge taken from the vagina the same. The first day I injected subconjunctival, Cyanide of Mercury 1-3000, 15 minims. Two days afterward, when I saw her, the eye was in full active stage of panophthalmitis, lids and conjunctiva intensely swollen, eyeball somewhat pushed out of orbit, cornea opaque and anterior chamber full of pus. I saw there was no hope of saving the eye, even if the patient lived, which was doubtful, but gave another injection of the Cyanide of Mercury. During this time she was being treated by the attending physician for her puerperal condition, but in spite of all treatments she died two days later. Could not obtain a post-mortem unfortunately.

Metastatic choroiditis is generally due to a septic embolus, carried through the blood channels to the inner tissues of the eye causing inflammatory reaction, followed by a purulent exudation at the seat of infection of the eye; milder cases may be due to bacteriemia, the bacteria being carried to the eye by the capillaries. This case being so rapid and disastrous was undoubtedly due to a septic embolus being carried directly to the eye by the blood vessels.

CHRONIC DACRYOCYSTITIS.

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THIS is essentially a chronic disease, found usually, but not always, in the aged, the chief symptom of which is epiphora, and the irritation of the conjunctiva, lids and cheek caused by its occurrence. It is at times apparently cured spontaneously in summer, only to recur with all its intensity in winter.

Under normal conditions the lachrymal secretions are evaporated largely in the eyes, and only a small amount reaches the nose through the duct, but any irritation as dust, cold winds, strong odors, etc., causes an increase which must be carried off, and when the duct is blocked or narrowed there is an accumulation of secretion and detritus from the eye in the sac, causing its dilatation and a chronic inflammation to result. This increases the flow of tears by irritating the eye, and thus we have a vicious circle established which is very annoying at least, and may be a source of danger to the eye.

In looking into the literature briefly we are struck by the many varied opinions as to its etiology and treatment.

Kuhnt¹ says that the reason treatment has been so unsatisfactory is because we have regarded it as a primary affection, whereas it is always secondary. It may be a result of:

1. General diseases, as tuberculosis, syphilis, and many acute or chronic septic diseases.

2. From the conjunctival sac. This is seldom the cause if the mucous membrane is normal, as is shown by the infrequency of the disease in acute blenorrhea or diphtheria.

3. Nasal disease. Recurrent coryza, hypertrophic rhinitis and alternation in the size of the turbinals are factors, but chiefly the sin-
uses are to be suspected. Brunzlow, working in Kuhnt's clinic, examined 63 cases of lachrymal disease and found definite sinus disease in 65.5% of the cases. In 11% there was a suspicion of sinus disease, and in only 3% were the nasal fossæ normal. Of the sinus cases the

maxillary and anterior ethmoid cells were by far the most often affected.

4. From the surrounding tissues, especially the periosteum and bone in the lachrymal groove and surrounding the duct.

According to Fuchs² the constriction of the duct, which is the starting point of the trouble, develops, as a rule, in consequence of affections of the nasal passages. Such affections are:

1. Inflammation of the mucous membrane. Under this head the various coryzas, acute or chronic, whether simple catarrhal, tubercular or syphilitic.

2. Ulcers. As tubercular, syphilitic or lupus. As the ulcers heal, cicatricial contraction or even obliteration of the duct may take place.

3. Tumors. These may occlude the lower orifice of the duct, and are usually polypoid in character.

In the new born this condition may be due to failure of the usual ante natal perforation of the lower end of the nasal duct, or to the formation of a valvular opening at this point, or to syphilis.

The symptom most complained of is epiphora, causing a constant wiping of the eye. This is worse in winter and on windy days, and if kept up long enough causes a chronic conjunctivitis and blepharitis. Later, we have an accumulation of secretion in the sac and its dilatation, shown by the appearance of swelling at the side of the nose, pressure on which causes it to empty itself into the conjunctival sac. An eczematous inflammation of the lid may occur from the irritation caused by the tears flowing over it which may lead to a cicatricial ectropion, which still further increases the epiphora. The constant bathing of the eye in pus and infectious matter leads very often to the production of that most feared of eye diseases, ulcer serpens, as fully one-third of all cases of this disease have associated a blenorrhoea of the sac. The case may continue for years in this mild condition, or as a result of an acute infection there is the development of a phlegmonous inflammation, causing an external opening of the sac, and the formation of a lachrymal fistula.

It is in the treatment of this disease that we find the greatest difference of opinion, some men being very radical and others going to the other extreme of conservatism.

Fuchs³ says that after correcting the underlying nasal condition,

the main burden of treatment must be in the removal of the stricture of the duct by gradual dilatation with Bowman's probes. As a preliminary he slits the inferior canaliculus, and, starting with a small probe, gradually increases until a No. 4 will pass through easily, after which there must be, at intervals, a continuance of the probing for months or years, to prevent contraction of the stricture. It is only after a failure to cure by these means that he advises removal of the sac by extirpation or obliteration.

Kuhnt⁴ says we must be thorough and individual in every case, extirpation of the sac usually being required, although in some cases nasal treatment and lavage of the sac with antiseptic solutions may cure. Probing is absolutely contraindicated in all cases, as it causes erosion of the mucous membrane and aggravates the case. He depends largely on nasal surgery to effect a cure.

According to Ostcwaet,⁵ of Paris, if the duct would remain permeable between two successive catheterizations a rapid cure might be effected; that it does not is due to the presence of cavernous tissue in the mucous membrane. To obtain then a lasting result it is necessary to leave a permanent dilator in the passages. Lead styles are very rational, but as they are not well borne by the eye, he uses 6 to 20 strands of Alsace thread. These are left in place for two to six weeks, or until a cure is effected, and he reports very good results from this method.

Priestly Smith⁶ favors the use of silver styles, after first slitting the canaliculus, and testing as to size and shape with a lead one. The silver style may be left in place for months, or until a cure is effected.

Others, notably Darier⁷, urge great conservatism in these cases, even the use of probes are opposed, and he relies largely on dilatation of the puncta, and irrigation of the sac with antiseptic solutions.

But at times all conservative methods fail and we must consider the more radical one of extirpation of the sac. Beard gives the following indications for its use:

1. Chronic dacryocystitis with mucocele and excessive dilatation of the sac.
2. Chronic suppuration of the canal, with recurrent phlegmonous inflammation, or caries of neighboring bony structures, or fungosities, with or without fistula.

3. Incurable obliteration of some portion of the nasal duct, through disease or traumatism, with troublesome epiphora.

The operation becomes imperative at once should the patient require an operation on the globe, as an extraction of a cataract, or in the presence of corneal ulceration, to prevent constant reinfection and the development of a serpent ulcer.

The technic of the operation has been so well standardized that there is no need of going into each step, but we must remember the exact anatomy of the part, if the sac is to be located easily, and a complete operation is to result. We endeavor to remove the sac in one piece, as in this way we are sure that no portion of the mucous membrane remains, which would prevent the success of the operation, by acting as a source of infection. After repeated attacks of inflammation it is, at times, impossible to remove the sac in one piece due to the many adhesions, and we must then rely on a thorough curettement of the parts. The wound should be sutured, and if it heals by first intention, there is an almost imperceptible scar remaining.

Most surgeons are of the opinion that it is unnecessary to remove the lachrymal gland at the time of operation, but should there be any trouble of some epiphora it must be done later.

In recent years there has been discovered or revived an operation consisting of making a permanent opening from the sac into the nose, the so-called dacryocystorrhinostomy.

Briefly stated it is as follows: The mucous membrane of the lateral nasal wall in the middle meatus is incised and elevated, exposing the bone underlying the lachrymal fossa. The flap is turned back over the inferior turbinal. The bone is cut through with chisel and forceps, exposing the nasal wall of the sac, which is removed. The mucous flap is now replaced and tucked in the opening to prevent closure, and the nose packed.

A modification of this operation has been devised by Pratt¹, who slits the canaliculus and injects the sac with cocain sol.; then passes a knife into the sac, dividing any strictures, until a No. 14 Theobald probe will pass. He then passes a dental burr on a long shank, and after protecting the nasal septum, bores an opening in to the nose. The sac is then washed and any shreds of tissue removed and the operation is completed.

With all this diversity of opinion, one comes to the conclusion that

there is no one means of treatment suitable for these very annoying cases, and that each must be worked individually.

Personally, I treat these cases along conservative lines, relying mostly on dilatation of the puncta, and syringing the sac with antiseptic and astringent solutions. If this does not give the desired result, then try Bowman's probes, without slitting the canaliculus. Later, if the case still resists, we must consider extirpation of the sac.

¹Kuhnt: Paper to the Ophthalmic section of German medical men in Vienna, Sept., 1913. Reviewed *Ophthalmoscope*, Nov., 1911.

²Fuchs: Text book of Ophthalmology.

³Fuchs: Do.

⁴Kuhnt: See above.

⁵Ostwalt: *Archives de Ophthalmologie*, April, 1911. Reviewed in *The Ophthalmoscope*, May, 1913.

⁶Priestly Smith: *Ophthalmic Review*, May, 1913. Reviewed in *The Ophthalmoscope*, May, 1913.

⁷Darier: *La Clinique Ophthalmologique*, May, 1910. Reviewed in *The Ophthalmoscope*, May, 1913.

⁸Beard: *Ophthalmic Surgery*.

⁹Pratt: *Ophthalmic Record*, April, 1915.

A NEW METHOD OF EXTIRPATION OF THE LACHRYMAL SAC WITHOUT RESULTANT SCAR—REPORT OF TWO SUPPLE- MENTAL CASES.

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THE two cases reported here were operated upon by me at the New York Ophthalmic Hospital, June 23d, 1916, by invitation of the Committee on Arrangements of the Clinical Session of the American Homœopathic Ophthalmological, Otological and Laryngological Society.

There are few operations that an ophthalmic surgeon approaches with less ardor than the removal of the lachrymal sac through a facial incision. A scar remains in every instance, and if the incision does not heal by first intention it is most noticeable and at times disfiguring. Occasionally the most experienced operators are chagrined to find after the excision in this way some of the original symptoms obtain.

The extirpation of the lachrymal sac is indicated when there has existed for a time an annoying chronic dacryocystitis, either of the catarrhal type with regurgitation of mucoid secretion into the conjunctival cul de sac, or the recurrent phlegmonous type.

The technique of the extirpation after the fashion I devised is quite simple. Ether anesthesia should be administered, although it is possible to excise the sac by a local anesthetic injected into the skin about it. Press thumb over sac area, then flush the conjunctival cul de sac with a saturated boric acid solution. Bowman's No. 1 probe is passed down both canaliculi to the bone; Weber's knife is then passed down both canaliculi making the usual Bowman slit; a curved bistuary severs the bridge of tissue that connects the distal ends of the canaliculi incisions. The anterior lachrymal crest is then located and the internal canthal ligament is divided at its insertion here. Through the incision special curettes are entered that break up the diseased sac and carious bone beneath and the debris is then scraped away. The canaliculi are scraped also. The excised area is then cleansed with a swab saturated

in 1 to 500 bichloride solution. A bandage is then applied just firm enough to keep the walls of the operated area opposed and to prevent swelling. The after-treatment consists of the renewal of the bandages for three or four days.

The advantages of this method of operation are:

- (1) No scar remains on the face.
- (2) There is little hemorrhage during the operation.
- (3) The difficulty to obtain consent to operate is removed, because no facial scar is assured.
- (4) There is no possible return of the condition as the mucous lining of the sac is ablated from the puncta to the upper portion of the nasal duct.

Conclusions as to results:

- (1) Cessation of all sac secretions immediately after operation.
- (2) Epiphora diminishes gradually and finally ceases.

I am indebted to Dr. G. DeWayne Hallett for the histories following:

CASE (1).—Sara Alter, of Dr. Hallett's clinic, 58 years of age, 1442 Boston Road, Bronx, has dacryocystitis since a child, and was treated by lavage, probes, etc., and at one time the lower canaliculus was slit. At the time of operation mucoid secretion was regurgitating into the conjunctival cul de sac, and pressure over the sac increased it. Ether was given June 23d, 1916. Bone found carious; sac lining and carious bone was scraped away. Head bandage applied. After operation secretion ceased and there was no reaction whatever. Epiphora was very slight at the end of five weeks.

CASE (2).—Helmi Tunna, of Dr. Deady's clinic, age 21, lives at Anderson street, Hackensack, N. J., had chronic dacryocystitis since childhood and had the usual treatments. An unsuccessful attempt at extirpation was made several years ago. June 23d, 1916, ether was given. Diseased sac and carious bone were scraped away. Head bandage applied. No reaction followed. Secretion ceased immediately after operation, and at the end of five weeks there was only the slightest epiphora.

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OTTIS MEDIA.

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WILL not take up all of the forms of otitis media, but will speak in a general way of the acute catarrhal and suppurative forms.

The middle ear is a small cavity situated in the petrous portion of the temporal bone; being in close proximity with the brain above; internally, the internal ear; posteriorly, the mastoid process, and below with the pharynx by which it is connected with the Eustachian tube. It is lined with mucous membrane which becomes continuous with the pharynx through the Eustachian tube, posteriorly, it becomes continuous with the mastoid antrum through a small opening known as the *aditus ad antrum*.

The middle ear is ventilated through the Eustachian tube; at each act of swallowing sufficient traction is made to open the canal and allow free admission of air which is necessary to equalize the atmospheric pressure upon the tympanic membrane; anything that interferes with this function, such as growths, large enough to fill the naso-pharynx, naso-pharyngitis, nasal obstruction, are predisposing causes of both catarrhal and suppurative otitis media.

In the acute catarrhal form there is an inflammation of the mucous membrane, increase of secretion of serum or mucus. The causes are: Atmospheric influences, colds, influenza, naso-pharyngitis, tonsillitis, infectious fevers. Anything of an inflammatory nature within the pharynx or naso-pharynx will, by extension through the Eustachian tube, cause otitis media.

There is usually pain which may be of a lancinating nature. It usually centers in the middle ear, but sometimes radiates over the temporal region to the teeth and may simulate a trigeminal neuralgia. It often extends down the Eustachian tube to the throat, and there is tenderness in this region.

In the purulent form the symptoms are more severe, temperature is higher and the danger of complications are greater and is more

likely to become chronic. In both forms of inflammation there is loss of hearing. Tinnitus aurium and vertigo may be present.

The termination of otitis media will depend upon the violence of the attack and promptness and efficiency with which treatment is instituted. If a purulent discharge is allowed to remain in the middle ear without sufficient drainage for any length of time, permanent damage will be done besides the danger of serious complications.

Children that are subject to frequent colds in the head and that have growths in the nose and pharynx have much less resistance toward aural troubles than those that are free from these conditions. Experience has also shown that children with these abnormal conditions are much more liable to have serious ear troubles following infectious fevers.

The treatment is both medical and surgical, usually the patient is not seen until after the pain has become severe or there may already be a ruptured ear drum exuding a purulent discharge. If the case is seen early every effort should be made to check the inflammation before pus has formed. The throat should be treated for any inflammation that may be present; it should also be freed from all discharge; the nasal cavity should receive the same attention. Dry heat applied to the side of the head, the leucodescent light or a hot douche will do a great deal to relieve the pain. Phenol, 12% in glycerine, warmed and dropped into the ear, or, better, to apply on a cotton cone and inserted to the ear drum, is one of the most useful remedies for local use before pus has formed.

As these patients are very susceptible to the least change in temperature, a large piece of quilting cotton covering the whole side of the head, will keep the ear at a more uniform temperature and add to the comfort of the patient; a hot water bottle may be placed over the cotton.

During the inflammatory stage the patient should be kept in the house and will save time and suffering by remaining in bed. An inspection of the tympanic membrane should always be made, and if there is bulging of the drum with pain which is not relieved by treatment, a paracentesis should be done.

In the purulent form where the drum has already ruptured and the pain continues, it is often due to poor drainage, and the opening should be enlarged; the canal should be kept free from discharge at all times

so that free drainage from the middle ear will not be interfered with. This can be done by wiping it out with cotton on an applicator, syringing with warm water, filling the canal with peroxide; etc. Whatever treatment is used, the canal should be left dry by the use of the applicator and cotton. The patient should lie on the affected side as much as possible to favor drainage.

If the discharge continues after the first few days in the suppurative form, the ear may be filled with alcohol and boracic acid, starting with a 50% alcohol diluted with a solution of the latter. The solution should be warm. Fill the canal after it has been wiped dry and let remain for five minutes; repeat this three times a day.

Gentle inflation should be started as soon as the inflammatory symptoms subside, and should be continued until the hearing is returned to normal. No patient should be discharged as cured until an accurate test be made of their hearing.

The homœopathic remedies are of great service in otitis media; in fact, I should feel lost without them in the treatment of these cases.

Belladonna is as often indicated in the acute inflammation as any other remedy. The pain may be shooting, darting or beating, and may come and go; the throat red, inflamed and dry; there is ringing, buzzing or roaring in the ears; other characteristic symptoms of this remedy will lead you to its choice.

Pulsatilla is useful in the more mild cases. In suppurative cases it follows Belladonna after the discharge is well established. The discharge is profuse, bland, yellow and muco-purulent. It is especially useful in women and children of a sensitive nature, and when there is relief from being in the open air or cold room.

Hepar Sulphur is confined mostly to the suppurative cases, especially in acute cases which Belladonna has failed to abort. There is a great deal of tenderness and the patient is sensitive to the least draft of air.

Mercurius often follows Belladonna or Aconite. The pain is more of a soreness and aching. It is especially useful in those cases that have colds in the head which tend to involve the Eustachian tube. The discharge is excoriating, offensive and may be bloody.

Kali Mur. will be called for after the acute inflammatory condition has subsided. There is loss of hearing, fullness and tinnitus as a result of swelling in the middle ear.

Silicea is useful in suppurative cases that have become chronic and the osseous tissue has become involved. The discharge is foul and scanty. There is fullness in the ear which opens at times with a loud report.

THE PHARYNGEAL TONSIL.

C. E. BEEMAN, M. D.,

Grand Rapids, Mich.

THE pharyngeal tonsil sometimes called Luschka's tonsil, adenoid vegetations, also the third tonsil, is situated in the vault of the pharynx. It is made up of lymphoid tissue similar to that in other parts of the body.

This gland is a physiological structure, and under normal conditions undergoes atrophy between the ages of 10 and 15 years. It is the pathological gland or adenoid growths to which I wish to draw your attention.

Situated in the naso-pharynx they are in close relation to the Eustachian tubes on either side, anteriorly the nasal cavities and below with the larynx and bronchial tubes.

Mucous and purulent secretions will often find their way into the stomach. This is especially true in young children who are unable to clear their throats and swallow the discharge.

Adenoids are most often found in children between the ages of 3 and 10 years, but may occur at any age.

I have often seen them in adults where there is an exciting cause, such as abnormal conditions of the nose or faucial tonsils. This constant irritation prevents their atrophy.

The infectious diseases of childhood, especially measles, scarlet fever and diphtheria, are a frequent cause of adenoids; acute and chronic rhinitis are among the chief predisposing causes.

Careless bathing of infants in a room not properly heated is often followed by acute rhinitis, which causes the pharyngeal tonsil to become enlarged.

Heredity undoubtedly forms an important factor in the production of hypertrophied lymphoid tissue, as two or more children in the same family are often found to be similarly affected.

Damp, cold and changeable atmospheric conditions favor their occurrence, probably by causing catarrhal conditions of the nose and throat.

Where the adenoids are large, the breathing is mainly through the mouth and is always aggravated at night, producing snoring and restless sleep. There is a constant liability to take cold, and the nasal cavities are filled with purulent discharge often streaked with blood as a result of the extreme vascularity of the adenoids.

Inflammatory conditions of the larynx, pharynx and bronchial tubes are quite common, while a persistent cough is often caused by the dropping of mucus into the pharynx.

Impairment of hearing and otitis media is present in the majority of cases. This is caused from direct pressure upon ostia of the Eustachian tubes or by extension of the catarrhal process into the same.

A slight deafness following colds in the head is sometimes the first symptom that will lead you to think of adenoids. In these cases nasal respiration is not always interfered with. Inspection of the tympanic membrane will usually find it retracted and slightly congested.

Laryngeal troubles, especially spasmodic croup, show a tendency to develop in the presence of adenoids.

In extreme cases where the growth is large and mouth breathing is allowed to go on for some time, certain characteristic symptoms are present. Those most marked are the open mouth, short upper lip, high arched palate and contracted upper jaw. The teeth to accommodate themselves will become crooked. The incisors will protrude and override those of the lower jaw when the mouth is closed. The bridge of the nose is wide and flattened.

Some of the more remote symptoms are deformities of the chest, especially pigeon shape breast, nocturnal enuresis, stammering, anemia and asthma.

The diagnosis is not hard in the majority of cases. The child that is a mouth breather with impairment of hearing and suffering from colds in the head during most of the cold months, should be looked upon as one with adenoids.

It should be remembered that any obstruction of the nasal cavities may cause mouth breathing and that these parts should always be examined before a diagnosis is made.

The index finger should be introduced through the mouth into the naso-pharynx; you will feel the soft worm like mass of adenoids. It is not uncommon after this examination to find oozing of blood in the

pharynx and the finger stained. This is quite diagnostic. A temperature in the afternoon and evening is sometimes caused from the catarrhal inflammation present. I have seen one case of this kind this last winter in which the temperature would vary from 101° to 102° , and kept up for a number of weeks, and entirely subsided upon the removal of the adenoids.

Remedies have given most satisfactory results in some cases.

If the symptoms are not too urgent the indicated remedy should be prescribed together with plenty of fresh air and suitable clothing.

Thuja Oil dropped into the nasal cavities at bed time acts in a very beneficial way, and should be continued for some time. If improvement follows that is satisfactory, the operation may be dispensed with.

Those cases that are urgent and do not respond to treatment should be advised to have a complete removal of the adenoids.

PRIMARY ULCER OF THE CORNEA.

FRANK B. MACMULLEN, M. D.,

Detroit, Mich.

BY primary ulcer of the cornea, I refer to those ulcers which are not dependent upon disease of nearby parts, such as conjunctivitis or inflammatory processes of the lachrymal sac; but ulcers which are usually traumatic in origin, and are so common in large manufacturing centers that they are treated with a contempt which they do not deserve.

By far the greatest predisposing causes of this type of ulcer are foreign bodies in the cornea. Most of the large factories of to-day have hospitals, or first aid departments, where minor injuries are treated and foreign bodies are removed by the score in the course of the day. In many cases fellow workmen remove these particles from each other's eyes. In one of our factories the authorities have recognized the dangers of such practices and signs are posted in the shops warning the men that they are to go immediately to the shop doctor in such an emergency. If a man is detected removing a foreign body from the eye of another, both are discharged. In spite of these precautions and the use of goggles and guards for emery wheels, most of the ulcer cases are among the factory workers.

While the removal of a foreign body is considered an operation that a sophomore student can perform, yet the disastrous results sometimes seen lead me to speak somewhat in detail of the methods we employ. The eye is first flushed thoroughly with a normal salt solution—Novocaine is then instilled and by the aid of a corneal loupe and condensing lens the foreign body is located. A flat, pliable corneal spatul which has been sterilized as carefully as one would sterilize an instrument for a cataract operation is usually the only instrument necessary. In cases where emery is the foreign body, a discoloration of the cornea usually remains after the emery has been removed. These particles are hot when they hit the eye and burn themselves deeply into the tissue. If the discolored tissue is not carefully removed as well as the foreign body, the eye will be sore for several days.

Small pieces of steel are removed with a magnet, which causes much less irritation and loss of corneal tissue. After the removal the eye is again flushed and a bland boracic acid ointment, containing 10% boric acid, is used. The eye is now covered with a bandage and the patient told to report the following day. He is not allowed to resume work until the conjunctival hyperemia has cleared away. No matter how simple these cases may seem, they are all treated in this routine way.

Where the foreign body has remained in the cornea for some time, or has been carelessly removed, an ulcer is liable to result. A bacteriological examination is made of each ulcer, and a careful examination made to detect the possibility of a foreign body still remaining. In this type of ulcers we find the predominating organisms are staphylococci and streptococci, diplo-bacilli or pneumococci, which roughly divides them into three bacteriological classes. Where the diplo-bacillus seems to be the causative factor, zinc sulphate is prescribed in 1% solution to be used by the patient three times a day, and the eye is flushed with a $\frac{1}{4}$ of 1% solution once every day. Atropin, 1% solution, is used three times a day and the pupil kept well dilated.

Boric Acid ointment, 10%, is the only remedy used aside from the Zinc sulphate and atropin. The diplo-bacillus type of ulcer rarely causes any trouble and heals quickly with this treatment. Where the staphylococcus and streptococcus is present, atropin and boric acid ointments are used. In rare cases of streptococcus infection, where the progress of the ulcer is rapid, I believe it wise to cauterize.

In the pneumococcus ulcer the cautery is used at once. Atropin and the boric acid ointments are used as in the other types. This ulcer causes more destruction of tissue and is harder to control than either of the others.

The use of the actual cautery and the various chemical agents has led me to believe that Phenol is the most satisfactory. In its application the eye is first anesthetized with novocaine and the phenol applied directly to the ulcer with a fine applicator upon which has been wound a few strands of absorbent cotton. This is followed with an alcohol application, and the eye repeatedly flushed with normal salt solution. If care is exercised the phenol cautery can be repeated as often as the case may demand.

Ethylhydrocuprein has not proven a specific for the pneumococcus

with me, but I have not used it long enough to decide its real value. Dionin I find of little value in spite of reports to the contrary. Argyrol is apt to leave a deposit in the tissue which will interfere with the vision when the ulcer has healed.

I am beginning to believe that a simple treatment of corneal ulcers is the best treatment, and the various irritant germicides, such as solutions of salts of mercury and dusting powders, are unnecessary.

What experience I have had with conjunctival flaps leads me to believe this treatment could be used to great advantage not only in perforating ulcers, but in any ulcer where considerable corneal tissue is involved. The danger of the ulcerating process continuing under the flap is minimized by a careful sterilization of the ulcer.

Hypopyon sometimes develops not only in the pneumococcus type, but where the staphylococcus and streptococcus is present. Before performing a paracentesis or the incision of saemisch which predisposes to an incarceration of the iris, I put the patient on stock vaccine, and have had some fine results, well developed hypopyon disappearing within a few days in some cases, and one eye which was discharging quantities of thick pus cleared up nicely. The vaccines act well in traumatic iritis also. My experience with vaccine in eye infections has been very gratifying and warrants their continued and early use.

Recently a case came under my observation. Man of about 35 years old had a large ulcer on left cornea, which had been under treatment by an oculist for several months. He also had an advanced case of pyorrhea. The ulcer was carefully sterilized, but showed little signs of healing until the teeth were removed. Most every corneal ulcer is accompanied by a mild iritis, and I believe a thorough prophylaxis of the teeth an important part of the treatment.

While the exigencies of each individual case must determine the treatment, the foregoing routine gives good results.

The object we seek is the least amount of destruction and the smallest possible scar, and I believe this end is obtained by first making a careful bacteriological examination and the application of a simple non-irritative treatment.

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CARCINOMA OF THE ETHMOID AND SARCOMA OF NASO-PHARYNX TREATED WITH MESOTHORIUM AND RADIUM.

CLINTON C. COLLIER, M. D.,

Chicago, Ill.

MY idea in writing upon this subject is to bring to your attention the use and abuse of Radium and Mesothorium in deep-seated conditions. The following two cases will serve as illustrations:

Mrs. G., age 50, referred to me by her family physician for an obstruction of her right nostril. Upon examination, I found a grayish bleeding mass completely filling the right nasal fossa. A diagnosis of malignancy was made and operation advised. On May 15, 1915, I operated, removing all of ethmoid cells and middle turbinate, also opened the sphenoid sinus. Examination showed that the papilloma had become carcinomatous.

I informed the family of a probable recurrence in a short time. By September the nose was filled nearly as badly as before the operation. On September 15, 1915, she entered the hospital and I placed 100 mg. of Mesothorium in the bleeding mass for 24 hours. No immediate reaction. I saw the patient 54 hours later and nothing could be seen of the mass, bleeding had entirely stopped. On October 1, 1915, she was again given a 24 hour exposure. November 1, 1915, she received another 24 hour exposure. Three weeks later the bridge of the nose began to swell and also the orbital tissue. This I thought an invasion by the carcinoma, but upon closer observation, I found that it was due to the reaction caused by the Mesothorium.

On November 24, 1915, growth was about half its original size. Twenty-four hour exposure of 150 mg. given, no reaction. Fifty-six hours later a whitish color of roof of the mouth presented and later disappeared. December 2, growth entirely gone. January 16, small reddish elevation appeared on salpingo-pharyngeal fold. I immediately gave 24 hour, 150 mg. exposure, no reaction followed. Patient was in good health apparently; weight, 155 lbs.

Jan. 15th, 1916, there was no change in the condition of the patient. The reddish mass was still in evidence. I made an application of 199 mg., filtered without rubber cover. A decided tissue reaction, a constitutional disturbance aggravated by severe pain in the head resulted. Blanching of palate bone was decidedly noticeable. After a fortnight patient began to improve slightly and returned to her household duties. In several weeks I noticed that this patient was developing a pallor. The blood values were taken and revealed a rapidly developing anemia with the Hamoglobin at 20 per cent. Pain in the head began to be more severe; insomnia developed, and her family physician was obliged to resort to the use of opiates, which gave her little relief. I recommended immediate hospital care for her; her improvement was tardy, pain still persisting; the palate became white, and in a few weeks a slough came away, leaving a hole about the size of a five cent piece, which opened into the nasal fossa.

This terrific tissue reaction, the cerebral pain, the slough, etc., was not due to malignance, but to the application of the mesothorium.

The result of the reaction was the closure of the left nostril and the formation of a mass of dense adhesions, as well as the severe constitutional depletion, impairment of vision, etc. The swelling slowly disappeared. After some weeks of observation of the case, I came to the conclusion that my experience with the use of radium and mesothorium was not sufficient to warrant my further application of these materials, and I was curing the cancer, but killing the patient. One month after the patient had recovered sufficiently, I referred her to Dr. F. H. Blackmarr, who used the regressive method with heavy silver filters, and also protected the mucous surface from the secondary rays by rubber stockings. Her recovery was gradual and without distress. She is now in good health, though a small part of the mass can still be seen.

Mr. B., age 39, came to me June 1, 1915, complaining of blood running down his throat. Upon examination I found a bloody grayish growth, about the size of a hickory nut, attached to the wall of the naso-pharynx. Microscopical examination revealed a large round celled sarcoma. I did not see this patient again until the middle of August. The post-nasal space was half filled, patient having lost 20 lbs. in weight.

On September 29, 1915, 24 hour exposure to 100 mg. of Meso-

thorium was given the patient; no reaction excepting a slight soreness of the teeth followed. After two weeks there was no change in size or condition of tumor. October 15, 1915, 24 hour exposure of 150 mg. of radium was given, resulting in no reaction excepting some pain in his teeth. Seven days later growth begun to necrose and slough off some. Patient was feeling fine, gaining in weight and returned to work.

My decision in treating these cases has brought me to the conclusion that no one but an expert operator who has had the training, observation and experience in the application of radium should be permitted to use the same. It is a specialty in itself, and I have seen wonderful results follow its correct application.

ABSTRACTS.

Science and Subjective Symptoms.—What Dr. C. E. Wheeler (*Hom. World*, Jan.) calls the Hughesian school has a tendency to reject as “Unscientific” all symptoms that cannot be clearly referred to a definite morbid anatomical condition. In practice, the strictest Hughesian does note and use subjective symptoms.

The words “Science” and “Scientific” are frequently in the mouths of doctors, but they are very apt to be used loosely, without precision. Science is exact knowledge; to be scientific is to seek for fact and not for opinion, to observe and experiment rather than to conjecture, to be slow and tentative in conclusion, and swift only to reconsider and test again. Our science must be shown in our method of work. It is possible to be an unscientific pathologist or bacteriologist. The clinical observer undertakes a far more complex task. To consider subjective symptoms is in itself no less scientific a procedure than to look through a microscope; it is more difficult. The strict Hughesian would say: “No drug will avail in pneumonia that has not produced a similar gross morbid condition,” but even he would have to choose among at least three or four drugs; the moment he begins to discriminate, he will find himself considering subjective symptoms. It is the peculiar symptom that individualizes the case and the remedy. We cannot dismiss the curious and unusual symptoms merely because they are curious, unusual or not understood; that would put a crown on our ignorance. To decide that because they are unusual they are, therefore, imaginary is to overlook the fact that they do occur in the course of disease; are they imaginary there, too? Then how doubly curious that the imagination of disease should, out of endless possibilities, select unwittingly a similar imaginary symptom to the one that came to be proven. We must apply the method of science to all subjective symptoms as they stand. In clinical symptoms there are multiplied sources of error. It is of vital importance that a clinical symptom to be so reported should have disappeared under the use of a drug that was otherwise well indicated and proved its suitability by markedly ameliorating the case. [And that it was not a coincidence or a natural result of the relief or disappearance of some pathological condition or

symptom.] Prejudices against symptoms cannot stand against repeated experiments; and, vice versa, no tradition can uphold a symptom if repeated experiments pronounce against it. Such accumulations of experience must clearly themselves be scientifically made in order to have any value. Detailed case records are the only material upon which much reliance can be placed, whether for promotion or rejection of symptoms. Of course, experiment is difficult. By the accumulation of cases suspicion grows to belief and belief nearly to certainty. There is never any harm in maintaining a healthy skepticism that demands the maximum of evidence [demonstration instead of assertion], provided it does not allow prejudice to refuse investigation of what is offered.

"I confess myself tired," writes Dr. Wheeler, "of the tendency to reject, in the name of science, evidence to which the method of science is not applied by the prejudiced judges; as tired as I am of the credulous acceptance of any evidence without a similar application of the only trustworthy machinery for the extraction of even approximate truth."—J. L. M.

Chicago Ophthalmological Society, Nov. 15, 1915 (J. OF O. AND O. L., Jan.).

Obstruction of the Lacrymal Passages: Destruction of the Sac With Trichloroacetic Acid.—Harold Gifford uses trichloroacetic acid, then packs the cavity with some aristol, merely to keep the cavity from filling with tears, and keeps a little zinc oxide ointment on the opening in the skin.

H. W. Woodruff has cured a number of cases of dacryocystitis in children (under ethyl chlorid general anesthesia), inserting the point of a syringe in the punctum and with one squirt syringing (what?) through into the nose—"that was the end of the dacryocystitis."

J. Sheldon Clark also cures children's blenorrhea with a simple lacrymal syringing. He thinks the intranasal route the best way of attacking the floor of the lacrymal fossa if you want good drainage and a functioning passage.

William A. Mann connects the lacrymal probe with a negative pole and ten or fifteen milliamperes of galvanic electricity.

Oliver Tydings: electrolysis works well if the stricture is fibrous, but not if it is osseous.

Iridotasis for Glaucoma.—Dunbar Roy reported five cases. The arguments for it are: 1. Its simplicity and ease of technique; 2. The immediate relief of symptoms is as permanent as that from any other operation; 3. Freedom from irritation in the healing. It leaves a fairly good bleb.

CASEY A. WOOD: The Borthen operation touches a probable cure for chronic simple glaucoma; it is the simplest and perhaps the most satisfactory method of dealing with this formidable disease.

Dr. Wood has found it easy to introduce iridectomy forceps through the small opening called for by Borthen and necessary for success; therefore, he suggests that in withdrawing the keratome, we press upon the posterior lip of the wound, so that a gush of aqueous carries the iris margin and the intermediate iridic zone through the opening, leaving the iris in the position desired.

In carrying out Borthen's ideas it is necessary to grasp the iris and pull it up still further (which constitutes the required stretching of the iris) and well outside the incision.

N. REMMEN: Borthen wrote four years ago describing his first operation, which was accidental. Oculists did not pay much attention because they thought it about the same thing as iridencleisis which Holth had just performed. Stretching the iris opens the spaces of Fontana and may keep them open at night. No other operation does this so well. Tension is higher at night. Hypertension may escape detection while daylight is contracting the pupil, but if the patient is put into a dark room for two or three hours so that the pupil dilates, we may detect increased tension with a good tonometer. Related a case which had been treated for optic atrophy; with palpation the tension was practically normal but the tonometer revealed glaucoma and trephining gave a very happy result.

WESLEY HAMILTON PECK: There is a striking absence of infection in Borthen's cases. In one of Dr. Roy's iridotases the iris retracted into the anterior chamber and had to be drawn out again. Borthen claims this can almost certainly be avoided by using atropin. Iridotasis is practically impossible if the iris is atrophic. It is important to make a very small incision, else the iris will almost certainly retract. Several of the speaker's friends told him they have practically given up trephining on account of the many cases of late infection following Elliott's operation.

HAROLD GIFFORD: The choroid is detached more often after trephining than any other operation, unless maybe the Lagrange; one does not appreciate how often this occurs unless one follows Elliott's advice and uses atropin regularly, and also looks for it. Gifford attributes it to the long continued low tension after trephining. He holds, also, that iridotaxis reduces tension by forming a fistula.

FRANK ALLPORT contended that glaucoma in a large proportion of cases is an expression of a general condition, and insisted that the patient should always have an absolutely thorough general examination. Returns are now coming in from the Elliott operation: late infections are reported and many are abandoning it. The Borthen operation appeals to Dr. Allport and he is going to try it.

Skin Grafting.—Walter R. Parker smears the skin (after the surface has been prepared) and also the knife with a thin coat of sterile vaseline; this practically eliminates all tendency of the skin to move with the knife. He has not found it (twelve cases) to interfere with the healing process nor been able to attribute any complication to this procedure.

Dr. Gifford will try this. An open dressing (advocated by Dr. Parker) is good but not essential. The speaker has always been able to stop the bleeding by pressing the flap firmly on the raw surface. If one put vaseline and aristol on wet cotton and, after covering the latter with gutta percha to prevent drying, put on a firm dressing, the graft will never peel off.—J. L. M.

Choice of Methods for Removing the Eyeball.—Carl Fisher, *Jour. of O. and O.-L.*, Jan.—*Evisceration* is preferable, unless tumor, infection (tuberculosis), bad laceration, "pain," sympathetic ophthalmitis or panophthalmitis with orbital cellulitis call for enucleation. The choroid and ciliary body must be thoroughly removed, the interior of the sclera inspected. Too close suturing of the sclera will interfere with its drainage and cause pain. Several radiating slits in the conjunctiva favor drainage of its post-operative edema. Insertion of a prothesis into the scleral sac has been largely abandoned, because the foreign body is usually extruded.

Simple enucleation is the least trouble but its cosmetic effects are undesirable. "The supposed danger of causing meningitis is not sup-

ported by careful criticism." Fisher has "never seen a serious hemorrhage after enucleation." Glassball prothesis in Tenon's capsule may be used in the presence of severe orbital cellulitis, and is called for in young children for the development of the orbit. Dr. Greenwood insists that most of the failures have been due to the use of too small balls, to careless opening of Tenon's capsule or to faulty suturing.

Has the prejudice against evisceration been due sometimes to desire for an intact globe for laboratory purposes? [Or to haste or laziness?]

At the Mayo clinic evisceration has been the choice for many years in uncomplicated cases; in no case for the last five years has sympathetic ophthalmitis developed—as far as can be determined. In cases where this was considered imminent, the eye has been enucleated, so sympathetic ophthalmitis in the eviscerated cases might fairly have been laid at the door of the scleral stump, although, theoretically, it is difficult to see how this could occur.—J. L. M.

The average winter cold starts in the head, and E. H. Griffin (*Med. Rec.*, Dec. 15, 1915) claims that 75 per cent. of such cases applying for treatment may blame improper use or neglect of the handkerchief. Instead of using the handkerchief properly, the patient hawks the secretion back into the naso-pharynx; some remains glued to the pharynx and palate and loosens with change of temperature (going out or indoors), leaving a string of mucus hanging, which provokes a constant cough, or even vomiting. This hawking, for which a uvula has been amputated, makes the pharynx irritable.—*Med. Rev. of Rev.*—J. L. M.

The nasal secretion normally is small in amount, transparent, colorless, odorless, tenacious and of slightly alkaline taste: it contains many ciliate epithelial cells, some leucocytes "and many micro-organisms."

Cerebro-spinal fluid is rarely discharged through the nose (traumatism, cerebral tumor); it is free from albumin and reduces Fehling's solution.

Pathogenic organisms may be: tubercle bacillus, bacillus of glanders, Loewenberg's large diplobacillus (which the writer thinks characteristic of ozena), oidium albicans, Weichselbaum's meningococcus

intracellularis (has been demonstrated in the nasal mucus of healthy individuals), micrococcus catarrhalis, and Tunncliffe has recently described an anerobic bacillus in early acute rhinitis; these bacilli, 5 to 8 by 0.3 to 0.5 microns, generally appear in clumps, are best stained with carbol gentian violet or carbol fuchsin, but only faintly by these, and develop on alkaline blood-agar in from five days to a month. They do not stain by Gram, methylene blue, thionin or the Gimsa stain.

Ascarides and other entozoa have occurred in the nose. Charcot-Leyden crystals have been found in nasal mucus in cases of bronchial asthma or of nasal polypi; with them there are usually many eosinophillic leukocytes.—Feb., *Med. Rev. of Rev.*—J. L. M.

The diagnosis of gonorrhea, writes Wm. J. Robinson (*Critic and Guide*, July), does not rest implicitly upon the microscope. The liability to mistake other cocci for the gonococcus is quite great, except in the hands of a very few experts. And the culture test is of still less value [?]. The totality of all the symptoms must be taken into consideration; and then you must always use—common sense. And some more common sense. Thousands of men and women have been declared to be suffering from gonorrhea when they were suffering from no such thing.

Dr. C. C. Warden, who has done important research work on the gonococcus states that Gram-Negative intracellular biscuit-shaped diplococci in smears were almost invariably shown on culture to be staphylococci. This knocks down all our time-honored conceptions about the gonococcus. Even if we do not fully agree with Dr. Warden, his statements deserve careful consideration.—J. L. M.

Sinus disease and pus formation, despite the text books, are *not* synonymous. Dr. Bordley operated a man with no history of intranasal disease and no pus in his nose or naso-pharynx; notwithstanding this, and that syphilis was precluded, there was found complete destruction of the posterior end of the cribriform plate and of the anterior wall of the right sphenoidal sinus.—*So. Med. Jour.*, Oct., abs. in *M. Rev. of Rev.*—J. L. M.

A nursing nipple for cleft palate has been designed by Mr. Oakley Coles: attached, sewed to the nipple of the feeding bottle, is a flap of

thin sheet India rubber cut to fit the roof of the mouth, shaped like the bowl of a teaspoon. During suction the tongue presses against this instead of the unprotected palate.—*M. Rev. of Rev.*—J. L. M.

The removal of a tonsil without clinical history is a violation of all that makes for decency and common honesty.—Sanger, *J. O. and O. L.*, Jan.—J. L. M.

Tonsillotomy and cauterization are only makeshifts. A general surgeon would under no circumstances remove a portion of a cervical lymph gland, because he knows that by so doing he might entirely miss the part most diseased. In tonsil work we face not only this danger, but we add the even greater danger of locking within the tonsil and crypts—by the resulting scar tissue—the very poison we seek to eradicate. Debris collecting within the crypts and undergoing organization frequently denudes the crypts of their lining epithelium. [We see this in the ear.] These masses, filled with bacteria, then lie in contact with the blood and lymph capillaries and it is easy to believe that, with any lowering of resistance, systemic infection will result.—James Bardsley, *So. Med. Jour.*—J. L. M.

Prolapse of the iris after cataract extraction should not be cut off until fourteen days after the operation on account of the danger of opening the corneal wound and inviting infection. When the prolapse is cut off fixation forceps should not be used because a sudden movement of the eye might then reopen the wound. If the eye is not dressed for nine days after cataract extraction infection will be rare.—Wm. A. Fisher, *J. O. and O. L.*—J. L. M.

Operated cases of suppuration of the antrum of Highmore will get along far better if water is kept out of the cavity than if a douche is used; in acute and subacute cases every drop of pus can be blown out with compressed air, repeated two or three times a week at the office; no home treatment.—A. H. Andrews, *J. O. and O. L.*

Lacrymal fistula may sometimes be cured with petroleum and silicea in alternation, a dose every fourth day, according to Von Boenninghausen.

Polypus Nasi.—Von Boenninghausen (*Hom. World*, Jan.) recom-

mended (1850): (1) Calc., Con., Phos.; (2) Aur., Bell., Graph., Merc., Nit. ac., Sil., Sulph., Staph., Teuc.

Prevention of Blindness in Argentina.—With every civil marriage certificate is included a printed advice that the parents take pains that the eyes of their newly born children are safeguarded from blindness; directions are given for this treatment at birth. When birth is registered a certificate is given with similar advice. In tramways and other places are displayed placards calling attention to prevention of blindness in the newborn. School books in the public schools contain illustrations of groups of the needlessly blind. Subcommissions in the several states of the Republic are being appointed to carry forward this work. In Buenos Aires free clinics for eye diseases are maintained. Small-pox, which has caused much blindness in Argentina, is being brought under control by vaccination and the number of the blind reduced. Immigrants with trachoma are refused entrance, as are persons already blind from any cause. A census of the blind in Argentina gives the number as 6,856—a proportion of about 80 in every 10,000.—*L. I. M. J.*, July.—J. L. M.

Isolated Paralysis of the Inferior Oblique.—K. Steindorff reports (*Kl. Monatsbl. f. Augenh.*, Oct.-Nov., 1913) this condition following surgical intervention in the maxillary sinus; probably the insertion of the right inferior oblique was disturbed at the level of the orbital border. In front view the left eye appears a little higher than the right [Query, upon careful observation would it not have been discovered that the right eye was relatively depressed?] and upon looking upward the difference is more marked. Diplopia vertical and crossed.—Abs. in *Ann. d'Ocul.* Juin, 1916.—J. L. M.

Corneal Herpes Following Antityphoid Vaccination.—V. Morax (*Ann. d'Ocul.*, Mai) reports one case, corporal, injected Feb. 15th, no result; again on the 22d—feverish, but temperature not taken; after two or three days slight herpes of the lower lip; third injection Feb. 29th: in half an hour some malaise; a couple of hours later, chills and temperature rose 2 degrees, normal in the morning and the following day had some lassitude ("quelques courbatures"). March 2, herpes on lips, right naris and behind right ear.

ABSTRACTS.

March 4th: right eye irritated, upper lid a little swollen. Next day pain and lachrimation; sent him to the surgeon.

March 7th seen by Dr. Morax. Still signs of his herpetic eruption, and there was clearly a typical right herpetic keratitis. R.v. $\frac{1}{4}$; l.v. 8/10. Local amelioration was rapid under conjunctival antiseptics, atropin instillations and an occlusive dressing.

The patient's general health is good; slightly subject to bronchitis, but he presents no manifestation of "bacillaire" lesions. Has never had a fever nor had to stop work; this is his first attack of herpes. It is fair to attribute the herpes to the vaccination because it recurred in analogous conditions: following a febrile movement consecutive to the vaccine injection and after an incubation of two or three days.

A case is mentioned, with caution, of paramacular *retinal hæmorrhage* occurring within 24 hours after the vaccination, accompanied by a general reaction. Because of the location vision was disturbed, but it was restored in a few weeks.

A soldier vaccinated against typhoid May 19, 1915, five days later presented *paralysis of each external rectus* with general paralytic symptoms; the latter disappeared little by little and the soldier returned to the ranks about the middle of June. He was seen by Dr. Morax a month later, when the paralysis of the externi still persisted. There were no other ocular symptoms. The Doctor admits that this case was but a coincidence.

Another soldier attributed his visual troubles to the vaccination; his loss of vision had, in fact, begun insensibly two or three months before and was due to intracranial neoplasm with hypertension of the cephalorachidian fluid and great edema of the optic nerve-head.

These were the only cases of this class in 1,700 eyes examined; Morax feels certain only of the first as surely attributable to the vaccination.—J. L. M.

Blindness From Cerebrospinal Meningitis.—Arnold Netter reported at a society meeting (*Ann. d'Ocul.*, Mai) two infants cured by spinal puncture and a more hopeless case, aged 2 years, which left the hospital blind on Aug. 7th, was diagnosed in September "very marked bilateral atrophy of the optic disc" and reappeared Nov. 10 completely cured, no sequellæ—apparently a spontaneous recovery!

Netter alluded to a cure of meningococcic irido-cyclitis with injection of antimeningococcic serum, and urged the importance of this serum in the treatment of cerebrospinal meningitis—that it be begun as soon as possible and pursued rigorously.—J. L. M.

Notes on the Galton Whistle.—In the use of the Galton whistle to test the hearing for high tones there will be confusion in recorded results unless the ears are examined by starting the whistle at its highest pitch. The fact of importance is that the Galton is heard at a higher pitch when the sound is made progressively less shrill, than when starting at a low pitch and going to the limit of hearing in the higher pitches. It is worth noting also that a border zone of indefinite hearing lies just above the highest pitch. With the whistle set in this zone the patient will say that the hearing of the sound is either uncertain or occasional. The great difficulty of outlining this border zone is due to the conspicuous puff made by the air from the whistle. Attention and fatigue are important factors in the value of the tests, and some effort should be made to record or give a suggestion as to the prominence of these factors. The surroundings should, of course, be quiet.

There is an interesting analogy between this condition of perception of higher tones earlier when starting from above the upper limit, and the observations of Luther C. Peter in his new book on the perimeter. "Visual Fields taken by passing the test object toward the center" [or more visible portion] "are larger than when the object is passed from the center of the periphery." These findings contradict the teachings of the physiologist that there is an acuity given the nerve by its functioning.

DOUGLAS MACFARLAN.

The Nose and the Genital Organs.—In 1897 Fliess announced the remarkable connection between the nose and the female genital organs. He claimed that many cases of dysmenorrhea could be promptly relieved by applying a local anesthetic to certain spots on the septum and turbinates. One gynecologist (at least) is sending many cases of dysmenorrhea to rhinologists for relief.—*Critic and Guide*, Jan. Sexual excitement in either sex is recognized as a cause of swelling of intranasal erectile tissue; masturbation, it is claimed, may be one of the causes of turbinal hypertrophy.—J. L. M.

Pyorrhea alveolaris is better treated locally with *iodine* than with any other one remedy—8 or even 30 grains to the ounce of glycerine. Apply it in the pocket about the teeth, and to the gums for tenderness of gum or tooth. Emetin kills only the endameba, which is but one of about a hundred and fifty germs found in the mouth. Iodine is efficient against all kinds of germs.—John L. Moffat.

Sugar Treatment of Ozena.—Charles B. Younger has used this in 54 cases and on the whole with very satisfactory results. Both the putrid secretion and the disagreeable odor disappeared in most cases in a short time:—The nose was first cleansed with a mild, warm alkaline solution, using either spray or douche. Then strips of gauze 1 inch by 8 are doubled, saturated with simple syrup, and gently packed into the *upper* recesses of the affected nostril; “indiscriminate packing will not suffice.” The syrup must be brought into contact with all “available” mucous surface. These packs are not uncomfortable, they may be left in place twelve hours and then removed by the patient. Repeat on alternate days for two weeks. With cessation of odor and crusts the patient is intrusted with self-care; night and morning cleanse the nose (as above); then snuff from the cleansed hand a generous quantity of powdered sugar.—*Critic and Guide*, Jan.—J. L. M.

Iocamphen is a perfect solution of iodine (10 per cent.) with camphor and phenol. It is a dark reddish-brown liquid, of glycerin-like consistency, for external application; it is free from iodides, alcohol, glycerin or any of the usual iodine solvents.

Iocamphen Ointment contains 50 per cent. of Iocamphen, and consequently has 5 per cent. of free iodine. “It is a remarkably smooth ointment, readily absorbed, and under the microscope presents more homogeneous consistency than any other iodine ointment in the market.”—*Critic and Guide*, Jan.—J. L. M.

WARNING.—**Be careful how you witness a will.**—A city physician did this for a patient, an old lady who, according to all signs, would live the rest of her life in the same city. Later he was called about fifty miles into the country, in the winter, to attest his signature for the probaton of her will, she having died in another county of the same state. The son, a lawyer, offered inadequate compensation and, this being unacceptable, never paid even the mileage provided by law.

Query—Can a surrogate in your state subpœna effectually a witness outside of his county? Outside of his state?—J. L. M.

REVIEW.

HELMHOLTZ'S DESCRIPTION OF AN OPHTHALMOSCOPE. H. Helmholtz, Professor of Physiology at the University of Koenigsberg, Berlin, 1851, Translation of "Beschreibung eines Augenspiegels," by Thomas Hall Shastid, A. B., A. M., M. D., LL. B., F. A. C. S., Superior, Wis., 1916, cloth, quarto, 33 pages. An edition of 500 copies, printed for private distribution only.

The thanks of the community are due to Dr. Shastid for this fluent translation, "The first translation of this classic into any language." As the translator says: There are two kinds of ophthalmology, that which came before and that which followed after the appearance of this book sixty-five years ago.

Like most epoch making inventions, the ophthalmoscope was slow of adoption. One distinguished colleague told Helmholtz he would never use the instrument—it would be too dangerous to throw light into a diseased eye; another thought the invention might be of service to oculists with defective eyesight—he had good eyes and wanted none of it. The mathematical and physical knowledge presupposed discouraged some.

Dr. Shastid thinks Herrmann von Helmholtz arose to his full height when he wrote the following, which, the translator says, is "probably the most significant sentence ever penned by an ophthalmologist:"

"In brief, I may hold the expectation not to be exaggerated, that all the alterations of the vitreous body and of the retina which, until now, have been found in cadavers may also be recognized in the living eye—a possibility which appears to promise the most remarkable advances for the hitherto undeveloped pathology of this structure."—J. L. M.

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Editorial

THE COMING MEDICAL SYSTEM.

THE *Literary Digest* for October 7th, 1916, publishes an unsigned article under the above heading in which the name of Dr. Richard Cabot is again projected upon the public screen.

The article claims that:

"Severe criticism of Dr. Richard Cabot for his prediction and advocacy of a new régime in medical practice has not been wanting, as readers of *The Digest* already know. But apparently Dr. Cabot is not alone among eminent medical authorities in believing that the downfall of the individual fee system is at hand and that some kind of corporate regulation of health will replace it. In The Modern Hospital (St. Louis), Dr. Alexander Lambert, Chairman of the American Medical Association's Social Insurance Committee, and widely known as the physician and companion of Colonel Roosevelt, states his belief that the change will take place in the direction of some such form of health-insurance as is now compulsory under Government auspices in Great Britain. That this is inevitable for wage-earners he positively asserts. Its forerunner—a workmen's compensation—has already been adopted in thirty-four States within six years. The next logical step, Dr. Lambert thinks, is to protect the wage-earner, not only when his disability is due to sickness or accident arising directly from his employment, but also from other sources. He says:

"Bills providing for just such protection to manual employees and other employees earning less than \$100 a month were introduced into the legislatures of Massachusetts, New York and New Jersey during the session of 1916. For these groups health-insurance is made compulsory, because experience elsewhere has shown that

voluntary insurance does not reach the persons who most need protection. The benefits provided are medical, surgical, and nursing attendance, including necessary hospital care, medicines, and supplies; also a cash benefit. * * * The cost * * * is to be borne two-fifths by the employee, two-fifths by the employer, and one-fifth by the State. * * *

“The organization of this medical aid under health-insurance presents very definite problems of which one is the adoption of a system of administration which will guarantee excellent medical service. A second is the adoption of a method of payment which will be not only adequate to the physician, but which will also encourage a high standard of service.

“An effort to solve some of these problems has been made in the third edition of a model health-insurance bill just published by the American Association for Labor Legislation. In this draft no single method of organizing medical aid has been saddled on any one insurance-carrier; instead, each carrier is free to select the method most suited to local conditions, subject to the approval of the social-insurance commission. * * *

“One arrangement which a carrier or a health-insurance union may adopt is that of a panel of physicians. If this method is selected, certain conditions must be fulfilled. First, any legally qualified physician shall be entitled to join the panel. * * * A second stipulation is the right of the patient to select any doctor on the panel, subject to the physician's right to refuse a patient. * * * A third condition is contained in the limitation placed on the number of insured patients whom a panel physician may undertake to treat. This is expected to prevent undue concentration of patients among a few physicians. * * * Undoubtedly the low rate of payment prevailing in lodge practice has tempted some physicians, if they are to make a living, to treat more patients than they can give careful attention to. The proposed establishment of a maximum number of insured patients will eliminate the most flagrant abuse on this score.

“A second method of organization is to employ salaried physicians, and to give the patients reasonably free choice among those so employed. This system, already common in industrial practice in this country, may prove especially advantageous in localities where a large number of persons are employed in any one industry or plant, because

of the familiarity which a doctor will gain of the illness traceable to the occupation. In still other areas a carrier, as a third possibility, may provide a district medical officer for the service of all patients within a specified area. Although these last two methods do not provide for the free choice possible under a panel system, the insured persons and their employers, through their representatives in control of each fund, are free to select the system the members prefer.

“Supervision of doctors by other physicians would effect an improvement over the present-day medical practice, since supervision will bring to light the incapable man who, by his actual handling of cases, has proved his inability. On such findings of fact a carrier responsible for the proper care of its members would be justified in excluding from its panel the physician who had proved incapable. This oversight is provided in the bill through the medical officer of the fund.

* * *

“The easy access to a second opinion, which will entail no extra expense to the patient, and the ready co-operation between the general practitioner, the specialist, and the hospitals would also be an improvement. Hospital care, as one of the benefits which have been paid for in the weekly contributions, is to be given during twenty-six weeks of disability in the necessary cases, with the approval of the medical officer and with the consent of the insured patient or his family, and may be demanded by the carrier if it is imperative for the proper care of the patient. * * * Financial arrangements for hospital treatment which have met the approval of the social-insurance commission may be made by the carriers directly with the hospitals. As an alternative, hospital care may be furnished in hospitals erected and maintained by the fund, with the approval of the commission. But, in either case, hospital care for the insured is to be paid for, just as other medical service for the insured will be remunerated.”

How are physicians to be paid under the new system? It is evident that they should receive adequate remuneration without the possibility of the overcharges that have sometimes amounted to a scandal under the present régime, even when balanced by charity work, for which no pay at all is received. Proper compensation for all work would seem to be fairer both to doctor and to patient. But what, asks Dr. Lambert, shall be considered “adequate compensation?” A search, he says, must be made for some basis which will escape the “lodge

system" of so much per person per year, which he regards as "opprobrious" and an encouragement to careless work. He goes on:

"Payment per visit, whilst it avoids this difficulty, since it remunerates the physician in proportion to the services rendered, and while it affords more considerate care for the patient, has the unfortunate practical disadvantage of being very costly. A compromise between these two systems may be made whereby a sum calculated on a per capita basis is divided among physicians in proportion to the services rendered by each. * * *

"A fourth possible solution is the employment of a few salaried physicians by each fund, similar to the arrangements made by many railroads. For this problem the bill has not reached a solution, and obviously, if any proposed solution is to be satisfactory to the medical profession, it must have their co-operation.

"The inevitable drift in this country to health-insurance, which presents new problems to the medical profession, requires the earnest thought of every physician. * * * As a result of such careful thought it will be possible to evolve an organization which not only will do no injury to the profession, but which will improve the medical service available to the American wage-earner."

It is indeed difficult for any one to predict just what will be the coming medical system. Let us hope that it will be better than the present or else the average graduate in medicine will find himself a little better off than the proverbial missionary in the West during the early pioneer days when his Pollianna was content to wear the cast off clothes of the more fortunate child of the East. The income of the average practitioner has steadily declined during the last twenty years, while at the same time the purchasing price of the dollar has decreased. The doctor has, therefore, been hit a double blow. Many guesses have been ventured as to the cause which has brought about this unfortunate change. One of the causes that we frequently hear is that the number of doctors has increased in greater proportion than the population and necessarily has produced a keener competition among them to get the business. The patient frequently chooses the doctor of the smaller charge rather than the one better equipped. No doubt, in the larger cities the hospital and dispensary abuse is largely responsible. Decline in the birth rate and the decrease in the number of acute ailments has all tended toward shrinking the practice of the

general doctor. The most contemptible of all guesses not borne out by facts is one that charges the doctor with lack of skill, or the equally vicious one, that he overcharges for his services. Ignorance of the facts may be responsible for such a charge on the part of the layman, but for the college professor such a charge is asinine. He is boomeranging himself for his part in making inefficient.

It is not to be denied that the family physician makes an occasional blunder which the specialist is able to discern, but he can not be a habitual blunderer for he would soon be left stranded in his practice. Should the family physician make a single blunder in a family whom he has cared for a number of years, that blunder will be recalled more vividly by the family than his hundred successes, and it is ill becoming of the consultant to in any way lay stress upon or emphasize the blunder of the unfortunate physician.

G. W. M.

LET US KNOW THE TRUTH.

ABOUT the first of September there appeared in one of the Philadelphia daily papers a lengthy article telling about the wonderful cures accomplished in the treatment of hay fever by a certain doctor of Osteopathy. The article was not prepared by the doctor himself, but by one of the staff writers. Furthermore, the article furnished the names and addresses of a dozen or more of those who were cured, residing in and about Philadelphia. A photograph accompanied the article showing the patients reveling in fields of golden rod and other weeds claimed to be the exciting agents.

The question arises, is the claim of cure a truth or a falsehood. If it is a truth, we should know more about it and eventually adopt the same method in the treatment of hay fever. If it is a falsehood, the article should never have been published and the hoax exposed.

G. W. M.

ADVERTISING IN SPECIAL LINES.

The science of advertising has been brought by this time to a distinctly high state of cultivation and yet we continually see the most glaring mistakes made and considerable sums of money wasted. My special plea in these few words is directed to those houses that supply

us in our specialty, and to my associates who depend upon those houses for good instruments and supplies.

Firms supplying specialties can best reach the consumer of their articles in the journals of that specialty, and physicians practicing that specialty can depend upon it that their best supplies (and cheapest in the long run) can be had from these advertisers. The specialist and the house have a mutual interest that cannot be superceded by any endeavor of the general supply house. Not only does this relation mean a better understanding of the needs of the specialist, but it means a better product and a greater responsibility on the house as to the quality of the goods. The "just as good as" of the mail order medical house is never quite as good as, nor actually as economical as the first-class product of the firm that makes it its business to attend to nothing else but this line.

D. M.

MEDICAL CARE OF THE NATIVE ALASKAN.

THE PROBLEM of caring for the natives of Alaska is among the most difficult matters which confront the government in its relations with the aboriginal tribes.

There is no central point in Alaska, Seattle being the trading centre of the Territory.

These people are scattered along a waterfront of more than 5,000 miles. They live in small villages. They are still influenced by the superstitions which have come down to them from the centuries. They hide, rather than seek relief for their ailments, believing that there is some divine retribution in misfortune.

Secretary Lane, of the Interior Department, who personally knows every part of Alaska, has given tender consideration to the needs of the native Alaskan, and great improvement has taken place in the care of these people, especially during the past two years.

Syphilis and tuberculosis, here as elsewhere, have wrought sad havoc with the primitive people.

The editor of the *Medical Sentinel*, in a trip just completed, in Alaska, was forcibly impressed by the special interest now being shown by the government in the medical side of care for the natives.

At Juneau, Dr. Douglas Brown, a recent arrival, is in charge of a splendid native hospital just completed by the Interior Department,

which looks after fourteen near-by villages. Dr. Brown serves under the Educational Division of the Interior Department, is a civil service employe and was for some years with Col. Gorgas on the Panama Zone.

At Haines a special hospital is soon to be erected for tubercular cases, and soon a colony with every modern equipment will be in operation.

In other portions of Alaska, seven or eight physicians have been put in charge of the medical Indian service, and three other small native hospitals are already maintained by the government in the territory.

An attempt is now being made by Secretary Lane to employ teachers in the Educational Division, for stations where no doctors are located, who are also trained nurses. These teachers have some special training for emergency medical work, are given a medical and surgical equipment of simple character, and provided with proper instructions for the service along medical lines. As fast as appropriations can be secured, district zones are being organized comprising a neighborhood of native villages, for which a general hospital and a competent physician is supplied.

The insane native has the benefit of care outside of Alaska, where, in a milder climate, the percentage of recoveries is very large. The tubercular insane live in a separate department, at Portland, Oregon, where they enjoy every qualification for modern treatment.

The Educational Department in these more recent departures seeks, among other things, to educate the natives as to the prevention of tubercular infection. Also as to the dangers of syphilis, its possible cure under appropriate treatment, thereby effecting the lowest possible evil to the living, as well as to the unborn progeny of the native races of Alaska.—*Medical Sentinel*.

THE NATIONAL COUNCIL OF TEACHERS OF ENGLISH—THE COMMITTEE ON AMERICAN SPEECH.

PROGRESS OF THE YEAR.

[“The National Council last year authorized the appointment of a Committee on American Speech, to be made up of persons in various walks of life. The intention was to form gradually a large and repre-

sentative body of men and women throughout the country who might co-operate in rousing public sentiment to the need and the possibility of improving the 'speaking voice,' and raising the standard of speech usage in daily life.

"No panacea for the 'public misfortune known as the American speaking voice' was looked for; no propaganda for any one's 'system' was contemplated. The aim was to bring into some sort of co-operation the many groups among our people interested in the general object who have been acting, hitherto, with little or no mutual understanding or support."]

The following is the report of this Committee, given at the summer meeting of the National Council, New York, July 7, 1916:

During the year just closed a number of things have been done, a number of lines of activity opened, which should prove important later on. Much more could have been accomplished if the officers of the Committee could have had more time for Committee affairs: the work of volunteers, in the intervals of their regular business, is unsatisfactory at best.

I. The Committee has grown in membership from sixteen to about one hundred and seventy persons. There has been no canvass, but one member after another has been added on the personal recommendation of some one already interested. A natural result of this chance growth is that the list is at present ill-balanced; some groups which one would naturally think of in connection with such a movement—the clergymen, the lawyers, the women's clubs, for instance—are but slightly represented. During the coming year a more systematic plan will be followed, and the list will be rounded out. It will be noticed, however, that the membership is not only widely dispersed geographically, but representative of leading persons in many walks of life. The list at present is:

TEACHERS IN COLLEGES AND SCHOOLS.—Prof. Raymond M. Alden (English), Leland Stanford University; Prof. Frank R. Arnold (Mod. Lang.), Utah State College; Prof. James W. Bright (English), Johns Hopkins University; Prof. C. C. Certain (English), Alabama Polytechnic Institute; Prof. S. H. Clark (Publ. Speak.), University of Chicago; Miss Claudia Crumpton (English), Girls' Technical Institute, Montevallo, Ala.; Miss Katherine Jewell Everts (Publ. Speak.), Leland Stanford University; Chas. M. Gaston (English), Richmond Hill

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2. During the winter the Committee sent a letter of inquiry to two hundred educators outside its own membership—presidents of

colleges, state superintendents, professors of English and other subjects, asking an expression of opinion regarding the desirability of such a concerted effort for better speech, and regarding the aims and methods of the Committee, so far as they had developed. Replies have come from nearly all of these letters, not one of them unfavorable. Letter after letter reads: "Heartily endorse your aims and methods; shall be glad to help."

3. Work has been definitely begun in a few states, where conditions seemed particularly favorable. The method followed has been to co-operate with local authorities, State Boards of Education, State Teachers' Associations, etc.; in some cases State Committees have been organized.

In New York, where speech improvement has received much attention of late years, from both city and state, the Committee has sought merely to support the school authorities in their excellent plans. The State Department of Education is about to establish an oral English requirement as part of the high school course, under the direction of the teachers of English. This is the most important action thus far taken in America, one whose influence will be felt throughout the country. Another forward step was taken last spring by the city of New York, making the special work for children with speech defects definitely a part of the school system.

In Alabama a State Committee is actively at work, with Miss Claudia Crumpton, of the Girls' Technical Institute at Montevallo, as chairman. The excellent work already done in interesting the teachers, the women's clubs, the state press, the business men's associations, and the farmers' associations, shows what can be done in many states when systematic effort is made.

In New Jersey, California and Indiana State Committees are now being organized, and the subject is to be stressed at the state teachers' meetings and at local gatherings.

4. In several ways the Committee has been able to co-operate with organizations not strictly educational, but which are interested in better speech conditions—a part of its work which is of special interest.

a. The Southern Conference for Education and Industry, an extensive organization of educators, business men, and farmers, has invited us to co-operate in its work for Southern schools.

b. The JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY, a well-known medical monthly, devoted its entire April issue to a symposium—the first of its kind—on "Speech, Voice, and Hygiene of the Vocal Apparatus," prepared with the co-operation of our Committee. Articles dealing with various aspects of these subjects, in relation to educational, social, and business activities, were presented by fourteen writers, none of them by profession a teacher of speech—including Mr. Otis Skinner, Professor Fred. N. Scott, of the University of Michigan, leading physicians, and representatives of the Chicago Telephone Co. and Marshall Field & Co. Though prepared, necessarily, at short notice, the symposium has been noticed favorably in a large number of educational and medical journals throughout the country. It may now be had in reprint form—a pamphlet of 88 pages, with illustrations, from the Nelson-Schram Co., 14 Devereux Street, Utica, New York, for 25 cents a copy.

c. The symposium is important in another way, as showing the possibilities of co-operation with the professional and trade press, presenting the subject, in special aspects, to readers who might not otherwise be reached. With the same end in view, a beginning has been made toward a publicity bureau. Circular letters have been sent to magazines and papers of various sorts, calling attention to new books in the field of the Committee's attention. More of this will be done this year. The bulletins of the library associations, also, should be furnished with lists of useful books and articles.

d. One of the most important developments of the year is the proposed Survey of Conditions as to Speech, Voice, and Vocal Hygiene in Chicago and Vicinity, to be undertaken this winter by Chicago members of the Committee, under the general oversight of the Chicago Woman's Club. This survey, the first of its kind, should be of great service to other communities. One immediately practical local result will be a working list of persons competent to give elementary instruction in speech and voice-training at small cost—pupils of leading teachers, for instance, whose work can be supervised by their own instructors. One leading music school, in fact, has already arranged for a system of laboratory classes, in which supervised instruction will be given in this way at a nominal cost.

The possibilities of definite results from co-operative effort are limitless. What is needed now is a permanent organization devoted to

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the one object of Speech Improvement, which can be a clearing-house of information for the widely varying activities of different groups already at work throughout the country, and which can help them, in various ways, to help one another—in other words, an AMERICAN SPEECH LEAGUE. Suggestions looking to the establishment of such a League have come to the Committee from many quarters. It is a matter of great satisfaction, therefore, to be able to state that the AMERICAN SPEECH LEAGUE, with which the present Committee will be affiliated, while retaining its special work with the schools, is now in process of organization, and will begin work during the autumn.

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ADENOIDS AND TONSILS WITH SOME HOMŒOPATHIC INDICATIONS FOR TREATMENT.*

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AN EXAMINATION of the literature on diseases of the nose and throat, particularly that devoted to the tonsils and adenoids, demonstrates that members of the homœopathic school who specialize in that department are as fully equipped and up to the moment as are their confreres, members of the old school. That they are regular in fact, as well as before the law, is proven, and that the allopath takes to himself that distinguishing mark, wholly without right, is not in the least in our disfavor.

Our surgery is fully equal to theirs, our claim for public confidence far greater, for we possess, in addition to their accomplishments, a system of therapeutics founded on scientific principles which neither fashion nor fad has made any change necessary since it was first promulgated, giving us far greater opportunities to cure quickly and permanently than those of the dominant school, if we but develop the skill to use it well. While I firmly believe that the members of this society are constantly proving the value of homœopathic therapeutics in connection with their daily work, honesty compels me to say, much as I regret to do so, that their published papers too often neglect to make it prominent; so that when those outside of our circle chance to read our journals, they see nothing which will indicate difference between ourselves and the old school. This often causes comment that we are no longer practicing what we say we do. If we fail to take for ourselves the credit of our system, we cannot expect others to do so, but the trend of the times shows plainly to those who are observing that the law of similia is being recognized by the scientists of the dominant branch of medicine, without much credit, and we should take that as a warning. The truth and principle of Homœop-

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athy will not die, but we may be cheated out of our birthright. Let us then tell of its application and success whenever opportunity offers, and it is for that purpose that I am about to bring before you, in a manner probably inferior to what any of you could do, some applications, according to homœopathic indications, of remedies in conditions incident to tonsils and adenoids when diseased.

I shall not take up time by going into the anatomy and physiology of those organs; reference to that is always at hand. The age when adenoids are apt to be found in an obstructive degree may be said to range all the way from early infancy to old age; but most frequently between the ages of five to twelve years. The location gives rise to varying symptoms and leads to varying results. When centrally located, even though small, may cause an obstruction to nasal breathing and make a mouth breather; while a much larger growth, situated laterally, may cause little inconvenience in that way, but may give rise to more or less serious ear conditions. The little infant who is unable to nourish itself because it must let go the nipple in order to breathe is likely to have an adenoid growth located centrally, effectually acting to close the posterior nasal orifice. Here, a few doses of the proper remedy and a few days of waiting might cure the condition, but I question if it is not our duty to relieve the present conditions at once by introducing a small instrument to remove the adenoid so that the baby may fill its stomach inside of an hour and relieve the mother of her worry at once, then prescribing a remedy, we prevent further trouble. That has been my method. In such cases I have usually found that the mothers needed treatment, which given, was all that was needed for the baby as well.

My experience has led me to believe that where there are hypertrophied tonsils, there are also adenoids present. It was formerly my custom to operate for the removal of enlarged tonsils and adenoids at one time. I usually so advised. I have modified that to some degree. In the course of my practice I found some patients who, through the will of their parents, I was unable to do more than an adenectomy, the tonsils being left for further observation. Somewhat to my astonishment after the removal of the adenoids the tonsils began to subside in most of these cases, and finally they approximated what we call normal in size. I then began to advise, in selected private cases, that the adenoids be removed and the tonsils allowed to remain, prescribing

a remedy, *calcareæ phos.* frequently, for a while and I found few cases where I needed to operate. Evidently the adenoids kept up a constant irritation and congestion which, being removed, prevented the hypernutrition of the tonsils. Where the tonsils are soft, hyperplastic, showing no adhesions and no evidence or past history of disease, I believe it better to give them a chance to be saved. In hospital practice, where the cases are many of them sent from the schools with instructions to remove both tonsils and adenoids, and there is no hope of our being able to follow up the cases, then we cannot be blamed for removing the enlargements at once, and make a complete operation.

The anesthetic I usually use is chloroform. It is given by the drop method, on an open mask and the instructions are that it be given not to exceed two drops to the second. Although chloroform has an unfortunate name, I find in going over more than 10,000 cases in which this has been used, I have had to record but one fatality. This applies to children. In adults I prefer ether. In some of these I have operated under local anesthesia, which is to some extent satisfactory, but usually the surgeon does not care to have his patient for an observer. Novocaine, one-half of one per cent. or one per cent., combined with a little adrenaline solution and injected in several places surrounding the tonsil serves to make a painless and bloodless operation and satisfies those cases who will not take a general anesthetic.

It is not the purpose of this paper to discuss the merits of tonsillotomy or tonsillectomy nor the various methods of operating, but I may say that in operating on children, particularly in my hospital work, I prefer the finger enucleation, on account of the ease with which it is done. In adults, and in all cases where there has been previous inflammatory conditions with consequent adhesions, the separation of the tonsils and pillars by the knife or scissors is, to my mind, far the best surgery; at least it is so in my hands.

Children are frequently very apprehensive when about to be operated upon and, although they may be controlled and anesthetized with little trouble, the nervousness may continue for some time after the patient has recovered consciousness. We have, in *aconite*, a remedy which, if given directly before the operation, will prevent this nervousness in many cases. After the operation, a very few doses of *arnica* will act as a preventive of extreme soreness and possible hemorrhage. If the neuralgic pains which sometimes follow operations for

enucleation are accompanied by real irritability, *staphysagria* may be the remedy. Individual cases produce their own peculiar symptoms which may need other remedies, but many will be benefited by those I have noted, and I find that the little doses are appreciated, and it helps to impress the benefits of homœopathy, especially if we take the trouble to explain why we have given the medicine.

I shall now try to give some indications for the use of a few remedies useful in diseases of the naso-pharynx. There is nothing new about it and you all know where to find the information just as well as I.

If we are to try to cure adenoids with remedies, the earlier we can prescribe the better.

CALCAREA CARB.—When the child takes cold very easily, is inclined to be fat, is of the blonde type, sometimes exhibits a great desire for eggs, craves chalk and other indigestible things, abdomen is large, perspires very freely, especially about the head, breathes through the mouth, you may give *calc. carb.* with confidence. But let me say here that the indicated remedy may be abused. It is well to avoid giving *calc. carb.* day after day for a long continued time. Rather give one, or, if you please, several doses and then let it act for a week, two weeks or a month, observing meanwhile its action. It will act far better in that manner. If given too frequently you may get no results or perhaps, instead, you will get aggravations.

CALCAREA PHOS.—*Calc. phos.* has the same general symptoms but with less tendency to fat and is more suited to the dark haired. There are evidences of mal-nutrition, especially regarding the osseous system. General tendency to glandular enlargements. In school girls there is often a vertical headache.

AGRAPHIS NUTANS.—This is a remedy which was brought out by Dr. Cooper, of London, and, while not proven thoroughly, has given satisfaction to some who have used it for adenoids, particularly, so it is said, during dentition. Personally, I have not been successful with it yet.

BELLADONNA.—Is one of our most potent remedies for swollen tonsils, the fauces bright red, the pain in the tonsils sharp, the pupils dilated. Many cases of quinsy have been aborted by its early use.

CALCAREA IOD.—Tonsils and adenoids enlarged with glandular

enlargements elsewhere. Dark, sallow individuals. Patient is always hungry but emaciates. Easy perspiration. Takes cold easily.

BARYTA CARB.—Tonsils inflamed with swelling of the submaxillary glands. Where there is a tendency to frequent recurrences of suppurative tonsillitis, *baryta carb.* will prevent it. Offensive foot sweat is noted. Malnutrition in children with faulty mental development.

KALI MUR.—After the acute symptoms of a tonsillitis have abated, *kali mur.* is sometimes useful in completing the cure. The Eustachian tubes remain swollen and the hearing is affected. The tongue has a grayish white coating and the crypts are filled with an offensive cheesy material.

LACHESIS.—We have here a tonsillar inflammation accompanied by great sensitiveness externally and much prostration. The tonsillitis begins on the left side and goes to the right. The membrane is grayish in color, and there is a sense of constriction. The patient cannot tolerate anything tight around the neck or body. There is a marked aggravation after sleep and it is not unusual to have the patient awaken from sleep with a sore throat, nothing of the kind being present when he retired. There is an agg. from hot drinks.

LAC CANINUM.—This remedy, while it has the same sensitiveness externally that is found under lachesis, differs in that the membrane is of a peculiar china-like, glossy white appearance, and it may appear on either side but the soreness changes rapidly from side to side. This *alternation of sides* is the great characteristic indication, and has been repeatedly verified. The pain on swallowing is sharp and extends to the ears. There is aggravation from either hot or cold drinks.

LYCOPodium.—Here we have the tonsillitis commencing on the right side, going over to the left. (The opposite of Lach.) The submaxillary glands are likely to be sensitive. The nose becomes dry and stuffed up, due to the swelling of the adenoids in many cases. The aggravation is likely to be from 4 to 8 p. m. The tonsils are studded with ulcers. Warm drinks generally relieve.

MERCURIUS BIN. IOD.—Tonsillitis beginning on the left side. The tongue is coated with a yellowish furry coating and there is a foul odor from the body and mouth.

MERCURIUS PROTO. IOD.—Tonsillitis on the right side. • Agg. at night. Other symptoms same as merc. bin.

PHYTOLACCA.—Phytolacca is a valuable remedy when, with a tonsillitis, we have a pharynx presenting a dark bluish-red appearance and where there is positive agg. from hot drinks. The pains shoot to the ears. Aching of back and limbs.

PSORINUM.—Indicated in frequently recurrent suppurative tonsillitis. Ulceration of the tonsils. As in kali mur. we find it indicated where the tonsils exude plugs of offensive cheesy masses. Patient is very sensitive to cold air.

TUBERCULINUM.—This is a remedy which should not be forgotten when there is a suspicion of incipient tuberculosis. The patient is subject to frequent colds and there is a nasal discharge which forms into "klinkers." There is always an aggravation from damp weather.

My chief desire is that, when you contribute your valuable papers to your medical societies or journals, you will make an effort to add something concerning the homœopathic therapeutics related to it, and there are few cases where it may not be made applicable in some way. It will not make your paper any the less valuable and may, when it falls in the hands of some one who is not a therapeutic nihilist, serve as an incentive for a further study of homœopathy. When you have seen your homœopathic prescriptions act promptly, give the credit publicly to homœopathy, and in that manner you will most efficiently serve the propaganda.

616 Madison Ave.

PAPILLOMA OF THE LARYNX REMOVED BY THE ROENTGEN RAY WITH PRESENTATION OF A CASE.*

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Philadelphia, Pa.

THOUGH it is my purpose specially to suggest for the treatment of papillomata of the larynx the Roentgen ray, it may be of interest to you for me to discuss as a sort of review some of the main things interesting in connection with the subject concerning this tumor, which is pre-eminently the benign growth most frequently met in and particularly characteristic of childhood. Another tumor, the fibroma, is only second in frequency to the papillomata during the period of childhood, and may be mentioned in association here because of its similarity histologically, and the successful results obtained in its removal by application of the Roentgen ray.

Given a case, however, in which a growth is found in the larynx, especially of a young child, one must first think of papilloma, since it is the most common of all benign growths and comprises nearly all the laryngeal growths in infancy and up to the age of ten years; often springing from localized points of irritation due to straining the voice, injury, whooping-cough, diphtheria, tuberculosis and syphilis; while on rare occasions it may be congenital. In some instances it seems to be spontaneous and others are the results of chronic irritation of a catarrhal character, and in my opinion, the most important factors from this source are adenoids and diseased tonsils, for the reason that frequently, due to their presence, the mucous membrane of the upper respiratory tract is involved with at least a passive inflammatory process: again, most of the cases that come to our notice do so for the purpose of being relieved of adenoids and bad tonsils when a growth in the larynx is discovered, perhaps because the patient is hoarse, aphonia is present, or even cyanosis and the peculiar facies.

By the use of the laryngeal mirror (indirect method) or the

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Killian or Jackson speculum (direct method) these growths are seen to exist single or multiple, mostly the latter in children; they may be tiny or large, pedunculated or have a broad sessile base and are either on the vocal cords, in the subglottic space, ventricles of Morgani or on the ventricular bands and in some instances they fill the entire larynx. When on the vocal cords they are on the anterior portion and their soft irregular gray or red surfaces are points with which we are all familiar.

Though the life of these growths is limited largely to the period of childhood, having a tendency to disappear with the physiological change of adolescence: during their presence, however, they frequently cause the patient a great deal of annoyance or discomfort, and may even cause death by complete stenosis of the larynx.

Histologically, the papilloma cannot claim any particularly individual identity since its structures are found in many kinds of tumors. Virchow believed that the fibrous elements were the essential and initiatory site of the pathological process, while others believe that the epithelial hyperplasia is the initiatory and the predominating feature.

However, the essential parts of a papilloma are a central ground work of connective tissue containing blood vessels, and a stratified squamous epithelial covering. In some instances the connective tissue ground work is excessive and in others the new growth will consist almost entirely of proliferated epithelium and often exists as a pachydermatosis.

Having hinted earlier that, according to Dr. J. W. Frank, the efficiency of the Roentgen ray in treating these growths is embodied in the peculiar amenability of the histological structures of this particular growth to the ray, and may possibly be further facilitated by the fact that papillomata tends to grow outward rather than invade the deeper structures and always contains some connective tissue, which by the way, is a point in distinguishing it from epithelioma in older subjects.

Much space in literature is given the older methods and technic of the treatment of papilloma of the larynx and but little to the newer one, the Roentgen ray; this is presumably because of the limited number of cases treated by this method to date. In order to review the more familiar methods in the briefest possible manner, I will classify them in the following way:

1. Internal Medication. Among the agents employed may be mentioned Arsenic, Potassium Iodide, Thuja Occidentalis, etc., the results of which have been exceedingly uncertain.

2. Endolaryngeal Procedures. These may be subdivided into two groups.

(a) The Conservative Method, which includes the topical application of medicaments and cauterizing agents as Thuja Occidentalis, massage with alcohol, castor oil, salicylic acid, silver nitrate, chloride of zinc, lactic acid, etc., practically all of which are followed by indifferent success or failure.

(b) Surgical Methods, which include removal by use of the snare, forceps and electric cautery by the direct or indirect methods. Fulguration may also be mentioned here, but all of these have their disadvantages and failures.

3. Extra Laryngeal Operations, in serious cases, are sometimes necessary where there is a marked stenosis with insufficient respiration. Low tracheotomy is employed with good results, which follow after the use of the tube for a period of years; thyrotomy is to be condemned because of recurrence of the growths and permanent injury to the voice.

Through the courtesy of Dr. Percy Tindall, the following case was reported by me before the clinico-pathological society in Philadelphia some time ago. At that time I favored surgical interference as the most effective treatment toward cure; shortly afterwards Dr. Weston D. Bayley communicated with me asking me to consider first the use of the Roentgen ray, as he had had previously some success by this means. I accepted his suggestion in which Dr. J. W. Frank kindly co-operated, and we present the results for your consideration.

CASE.—W. J. G., boy five years old, was first seen by me October 15, 1913, at which time the following history was obtained: Whooping cough ten months ago, shortly after which he was vaccinated; the latter being quickly followed by a severe attack of varicella. The present condition was first noticed six months after the whooping cough in the form of marked hoarseness, which now alternates between hoarseness and aphonia. He was then taken to a hospital, where the mother was told his post-nasal space was filled with adenoids. These along with the tonsils were removed six months later, after this his speech seemed to grow worse. Two weeks later he was taken back

to the same hospital for an examination of his throat by the laryngologist, who then sent him to a different hospital for the opinion of another laryngologist, who did not see the patient, but whose assistant, after three days' observation, advised that treatment was not necessary, but that he should be sent to the country for a couple of weeks, from which he returned unimproved; he was then sent to Dr. Tindall, under whose care he improved.

Examination of the larynx shows a pedunculated grayish red body the size of a split pea, with an irregular surface, extending from beneath the left vocal cord near the thyroid angle. The same condition, sessile in form, exists on the upper surface of the same cord along its entire length, involving the ventricle and ventricular band, which is also slightly injected. Complete approximation of the tune cords is not possible because the pedunculated body is forced upwards between the cords on attempt at phonation; motion of the affected vocal cords is not impaired and there is no embarrassment of respiration.

Examination of the Pharynx. Post-nasal space shows remains of adenoid tissue.

Examination of the Nose. Shows a marked deviation of the septum to the right, hypertrophy of both middle turbinates and hyperplasia of the inferior turbinates.

Examination of the Ears. Shows both drum membranes to be retracted, thinned, light gray in color, and freely movable. Scar tissue not marked though there is a history of a discharge from both ears at intervals since one year of age, the hearing being slightly below normal.

August 12, 1915. Patient has returned one year and ten months after the first examination. In this time he has grown rapidly, is well developed and has received constant treatment for his laryngeal condition during the interval of his absence; this consisted of surgical procedures, at first every two weeks, then once a month until ten operations were performed. These were followed by alcohol massage (99 per cent.) twice weekly until his return to me. The mother says the child is improved but at present is not as good as he was because he has not had the alcohol treatments for two weeks.

Examination of the Larynx, Left Side. The swelling in Morgani's ventricle and of the ventricular band is more marked than on the previous examination. The growth on the upper surface of vocal

cord previously described is not present. The vocal cord is thick and red, and has lost its sharp edge on the free border, and instead of one pedunculated growth at the thyroid angle under the cord, there are two or three, these prevent the vocal cords from approximating on phonation. Right side, there is swelling of Morgani's ventricle and the ventricular band which almost obstructs the vocal cord from view. The latter is thicker and more red than normal. I now advised the use of the Roentgen ray, which advice was treated in a jocular manner by the physician treating the case and his friends, who insisted that the alcohol would be a sure cure.

September 17, 1915. One month since my last examination; in this time he has received the alcohol treatments regularly by the other laryngologist; his voice is greatly improved, and only a small pedunculated growth remains under and a small red one on the upper surface of the left vocal cord near the thyroid angle and there are no nocturnal attacks of dyspnea as formerly.

September 21, 1915. On examination by the indirect method I observed that the growths on the upper and lower surfaces of the left vocal cord were slightly larger. The direct method of examination proved to be of no advantage over the indirect, if as good. There had been no treatment with alcohol since his last visit to me, four days previous, and there was increased hoarseness; the parents now felt that there would be no permanent result from the alcohol method, and asked that the Roentgen ray be applied. This was done by Dr. Frank the same day.

September 28, 1915. One week since the first Roentgen ray treatment; there is an improvement in the voice which is more steady and does not break as previously, when the red, inflamed and pedunculated growth was forced upward between the two vocal cords or on top of the left one (the pedicle being at least three-sixteenths of an inch in length), on phonation; the body of the growth being reduced to the size of a pin head, the pedicle shortened, the whole being pale pink in color and situated exactly between the cords; a small growth the size of a pin head on edge of the same cord was reduced almost completely. The ventricular bands, ventricles and subglottic space are all practically normal, which were formerly swollen, probably more from the manipulation or injury sustained during the other methods of treatment.

October 5, 1915. Two weeks after the first treatment. The pedunculated growth is practically unchanged, while the smaller one on the edge of the cord had entirely disappeared, both cords remain thicker and redder than normal.

October 19, 1915. Exactly two weeks since the second Roentgen ray treatment, both cords are white and their edges thinner and more sharply outlined than at any previous time, and all the other parts of the larynx now seem normal. The growth on the left vocal cord near the thyroid angle remains, and is about as large as a pin head or a small shot. It is more pale in color and the pedicle is shorter than two weeks after the first treatment; the growth is now resting on the edge and upper surface of the cord.

October 26, 1915. The tumor seems to be unchanged, and exactly as it appeared one week ago.

November 11, 1915. Two weeks after the third treatment the growth is smaller than on my last observation, the pedicle is more flaccid, and on phonation the growth is forced up between the vocal cords, dropping over on the upper surface of the left cord and falling back into the subglottic space on inspiration.

November 24, 1915. One week after the fourth treatment, the little growth appears to be about the same as on the last observation except that the pedicle is probably a trifle shorter, the patient is a little more hoarse, the vocal cords are thickened, their edges rounded and dull, and the left cord is slightly bowed, there being no noticeable change in color.

December 7, 1915. Two weeks after the fourth treatment. While the growth is about the same size as on the last observation, it seems much more flaccid, and comes only to a point between the edges of the cords on phonation, but does not affect the voice, the pedicle is as thin as a tiny thread, it is red and attached to the under surface of the true cord at about its junction with the lateral wall of the larynx.

January 25, 1916. Seven weeks since the fifth and last treatment. In this period the patient has been ill with influenza, and now has rhinitis and a marked laryngitis. The mucous membrane of the entire upper respiratory tract, including the vocal cords (which are thickened and red) is extremely red and thickened, he has a hard dry cough at night, and the little tumor has completely disappeared.

The patient has since been observed from time to time; he is in

good health, his voice is clear, and there is no attempt at recurrence of the growth.

If we recall the above review of the different methods of treatment and those employed in this case before the Roentgen ray was adopted, we will remember that the results of internal medication are practically nil, and that local treatment by medicaments and caustics are but little more efficient with the necessarily long drawn out course of manipulations, great annoyance to the patient, and rarely any results of a permanent character obtained: that surgical procedures are attended by much discomfort and pain to the patient through the numerous attempts or steps necessary for its removal, trauma to the parts, permanent loss of voice and constant recurrence of the growth.

Why then should we not readily greet this newer method, the Roentgen ray, with hearty enthusiasm and confidence? A method which does not cause the patient a moment's discomfort, one that is so simple, so clean and so effective; no manipulations or injury to the parts, almost immediate results in restoring voice and comfort to the patient, and lastly, the most important, no recurrence.

An interesting thought to one who is about to employ the Roentgen ray in a case of this kind for the first time may be how will the growth be influenced, and will there be any visible process? We have heard in the above history that the effect and process was plainly visible in that the inflammation and swelling of the surrounding parts were quickly reduced, and that the growth gradually disappeared by a process of shrinking, with marked improvement in the symptoms, and final cure of the condition.

Burning need not be considered as a complication or contra-indication in the use of this method for this possibility is a remote one since the arrival of the Coolidge tube, and when carried out by competent hands, such as those of Dr. Frank, with his particular system of concentration by crossing the rays at the seat of the growth.

In closing, it is a pleasure for me to thank Dr. Frank for his co-operation in the treatment of the case presented in this paper.

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1831 Chestnut Street.

ROENTGEN TREATMENT OF BENIGN GROWTHS OF THE LARYNX.

J. W. FRANK, M. D.,
Philadelphia, Pa.

THE ROENTGEN treatment of benign growths of the larynx has been quite successful. The main points in its application are the recognition and application of the proper technique. In order that we may select the proper technique it is necessary that we understand the action of the Roentgen ray on the cellular structure to be treated. Let us, for a moment, consider its action on normal tissue. Corscaden makes the following report as recorded in the *Medical Record*, December 11, 1915:

He claims that the Roentgen ray differs from other agents in its ability to reach any cell of the body without being influenced by fluids or osmosis. It reaches the nucleus of the cell without regard to cytoplasm and can, therefore, if the nucleus has a high power of absorption, affect this independently. The effect of small doses of X-rays upon the nucleus is to increase the cytolytic growth activity with more rapid mitosis and increase the number of cells. In large doses this lawful activity became lawless and results in pyknosis and nucleolar disintegration and later vacuolization and rupture of the cytoplasm ending in the death of the cell. The types of cells most affected are those whose nucleolar construction is least stable. Why, otherwise, one cell is affected and another not, has yet to be definitely shown, but might lie in the fact that elements of different coefficients of absorption might require rays of special penetration quality for that absorption, and that this difference between the cells might depend upon the amount of those various substances contained in the cell. Applying this action to the tissue their susceptibility is found to be in about the following order: the lymphocytes, polymorphonuclears, parenchymatous glandular structures, connective tissue and bacteria are more readily destroyed, while the myeloblasts are very resistant, persisting in the blood of leukemias in spite of all X-ray treatment.

I wish to call your special attention to certain points in this re-

port. In the first place he points out that Roentgen rays reach the cells without being influenced either by fluids or osmosis, therefore, reaching the nucleus of the cells, each of which nuclei probably has a different absorptive power, these responding differently to uniform doses of rays. Another point is that small doses of X-rays upon the nucleus have slightly increased its cytolytic growth and activity with more rapid mytosis and increased the number of cells. These two points are of prime importance in determining what mode of treatment to pursue in each case. Small doses when we want a stimulating action, and massive doses when it is the destructive action that is desired.

Having determined the character of the lesion it only remains to apply the rays of the proper character and in the proper manner. In selecting the technique for a growth in the larynx or any other part of the body we can readily see that it is the destructive action that we desire which means we must get the largest amount of rays to reach the growth that is possible without burning the skin, and in order to do this we follow out two lines of procedure.

The first: Using a tube of high vacuum, the rays filtered through from three to four millimeters of aluminum in order to filter out those rays that would have a destructive action upon the skin and would not penetrate deep enough to affect the growth, as it is only those rays that are absorbed by the structures that influence them. In order to get the largest amount of rays to the growth we make use of what is known as the cross-fire method. By this means we can direct a full skin dose through a number of different ports of entry and have the tumor receive the accumulated dosage of all. This has been my procedure in the Roentgen therapeutic application to growths of the larynx as well as other parts of the body.

Summarizing: The technique then would be the following: High penetration equal to about a nine-inch parallel spark-gap; filter of three or four millimeters of aluminum; a cross-fire application from a number of ports of entry and an exposure sufficient to turn a Sabourand pastille to five or six points on the Hampton radiometer scale, this giving a fairly accurate measurement of the dose received by the patient. The treatment should be repeated once in three weeks until a cure is accomplished, usually requiring from three to five series of treatments, rarely six. Any untoward effect upon the skin can be

controlled very nicely by the use of a saline wash made of bicarbonate of soda, one to four, avoiding all oils and ointments.

DISCUSSION OF DR. ALEXANDER'S AND DR. FRANK'S PAPERS.

J. W. FRANK: There are dangers to be avoided; injury can result from the Roentgen rays. Some men have claimed that with certain apparatus one can not cause a burn. If that is the case you are not getting the X-ray because it will burn in spite of what the makers of certain instruments may say.

GEO. W. MACKENZIE: The treatment of tumors of the larynx, both benign and malignant, should be preceded in all cases by an accurate diagnosis. The only way to do that is to get a piece of the tissue and have it examined microscopically. In the event of its being malignant we should inform the patient and get consent to go ahead and operate immediately. So far as the X-ray goes it has its field of usefulness; circumstances must determine the mode of treatment, but in general I think it would be better to do a laryngo-fissure operation. It is a more direct way of getting at the trouble. If a laryngeal tumor is reported to be malignant—carcinoma for instance—I would not begin with the X-ray, I would remove it radically and then cauterize it carefully. I lost a case from the carelessness of an assistant inserting a hook retractor into a healthy surrounding tissue after it had been in the cancerous growth. I prefer the direct application rather than through the tissues of the neck. I am familiar, however, with the excellent work done by Dr. Frank, and have availed myself of his services when occasion required.

T. L. SHEARER: How do you regulate the time of exposure?

J. W. FRANK: Sixteen milliamperes minutes, or an application of four milliamperes for four minutes at each point of entrance.

G. W. MACKENZIE: Is it not possible to use the X-ray in such a manner as to get a stimulating instead of a destructive effect?

C. L. RUMSEY: Do you know anything about Philip's flash light; has it any advantage over the continuous application?

PRESIDENT: I want to take exception to Dr. Alexander's statement that this is a new treatment. Some fourteen years ago a little girl came to me with her larynx full of papillomata. They were so numerous that they obstructed respiration and necessitated intubation. She wore the tube for three or four weeks, and could not go without

it. I advised tracheotomy. The father of the girl was the coachman of a trustee of the Lakeside Hospital, and the child was taken there. Drs. Lincoln and Crile performed a low tracheotomy. I saw more or less of the child for the following five years.

The X-ray was used at the hospital a great many times. After five years the child was still wearing the tube and had a lot of papillomata in the throat. I question very much the influence of the X-ray in this case. It seems to me to have had but little effect. Of course, the X-ray was not then in the state of perfection that it is to-day, and I should not offer the case as a refutation of the value of X-ray claimed by the doctor, but merely to show that it is no new conception.

G. J. ALEXANDER: I did not wish to convey the idea that this is a new treatment; I simply said a "newer" method. It is a method that is not employed regularly by any means. I think the X-ray deserves a place among the different methods of treating tumors, greater than it has had up to date.

As to laryngo-fissure for a simple papilloma, I feel that it is too radical a procedure. Why should a patient be subjected to a big operation and the use of a tube for a long period when something simpler and much less formidable will suffice?

G. W. MACKENZIE: Laryngo-fissure is always effective; while there is some doubt about the other method. Rest to the voice is a benefit.

G. J. ALEXANDER: In reference to resting the voice the child was sent to the country for that purpose without improvement. The operative procedures, which were ten in number by different doctors, did control the tumors to a considerable degree but there was recurrence.

J. W. FRANK: I tried to make it clear that we could get either a stimulating or a destructive effect by means of the X-ray. The stimulating effect comes from small doses; it is only by using the largest dose that the patient can bear without being burnt that we get the destructive action. We get the dose large enough only by utilizing as many points of entrance as the nature of the part will allow. There is hardly any doubt that the case spoken of as occurring fourteen years ago was treated with low power tubes. They did not have the penetrating power that we do now, and the rays were not filtered. There-

fore, the stimulating action was about all they got. I doubt if it had any beneficial effect upon the growth. As to the time of exposure, it is governed by the rule spoken of. About 16 minutes for one milliampere; if four milliamperes are used it would be four for each. You must get all the points of entrance for the rays that you possibly can in order to get the destructive action that is wanted. In regard to the flash light, it is now considered to be of no practical importance. It was of great importance, however, in times past when the old style gas tube was used. It is now of little service. The reason is that in the old style tubes the penetrating power was at its highest at the moment the rays were forced through the tube. Therefore, the flash was used to give the greatest number of such moments and thus to penetrate deeper. The flash also helped to keep the tubes cooler, but now the improved tubes can be cooled perfectly by the blast of air that is used. They do not become too hot. The penetration is dependent upon the heat of the cathode controlled by a rheostat. It can be worked by a small thumb screw and kept under perfect control. The meter shows just the penetration. In this way we regulate the size of the dose, and are sure that we get the destructive action and not stimulating action.

THE RELIEF OF PAIN IN MALIGNANT DISEASE OF THE THROAT.*

THOMAS L. SHEARER, M. B., C. M., EDIN.,

Baltimore, Md.

ON DECEMBER 7, 1915, Mr. S. F. P., aged 70 years, consulted me at my office about some throat symptoms which had been annoying him for the previous two months. Prior to his visit to me he had for a very short while been under the care of Dr. Irving Townsend, of New York, who kindly referred the patient to me for treatment, as he expected to reside in Baltimore during the winter.

Mr. P. was tall, thin and ascetic in appearance; he was a wiry looking man, active for his years, but moved about in a rather depressed way; his facial expression, with its many lines, portrayed, in a dramatic manner, a life of suffering. In going over his history and his illness, he mentioned that during the last twenty years of his life he had suffered intensely from a serious condition which had involved the intestines. It was not possible to obtain from him a very clear idea of this abdominal disturbance, but during the twenty years he had undergone at the hands of able, experienced physicians and surgeons six or seven abdominal operations. At the time of his visit to me he complained of constipation and of a tendency of flatulence to accumulate in the right side of the abdomen; this latter symptom occasioned him great disturbance of mind and body; he felt that he was losing ground, becoming weaker, much thinner, and he attributed the entire group of his symptoms—even those of the throat—to the condition of the intestines. On examination, the abdominal walls were found to be greatly relaxed, there were a number of scars—the sites of the incisions for the different laparotomies—and the intestines, particularly the large bowel, seemed to have lost a great deal of their tone and were relaxed also. In the right iliac region and the part above it could be felt, on deep pressure, a number of enlarged, indurated glands, and the question then arose, were these glands the site of a metastasis or was the throat condition secondary to the abdo-

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men? In the course of questioning Mr. P. he mentioned that he had been an inveterate, hard, steady smoker; in fact, during his business day, he had seldom been without a cigar in his mouth. In describing the commencement of the throat trouble, he stated that about two months prior to December 7, 1915, he had felt a very decided uneasiness and discomfort on the right side of his throat whenever he swallowed. His family physician, on mere inspection of the oro-pharynx, did not discover anything abnormal in the appearance of the parts; so the patient put up with these symptoms for a while longer until they became more pronounced, when his physician sent him to Dr. Irving Townsend. Dr. Townsend discovered an ulcer with an indurated base on the right side of the tongue posteriorly, situated so far back that it required a laryngeal mirror to bring it into view. A Wassermann test was made and was found negative; it was then made plain to the patient by Dr. Townsend that the condition might prove to be of a serious nature; in fact, to be of a cancerous type. As the patient shortly after this came to reside in Baltimore, he was then transferred to my care. On examination of the throat, I found an ugly (looking) ulcer about one and a half centimeters in diameter, surmounting in a crater-like fashion an indurated, infiltrated base about two and a half centimeters in width, located on the right border of the tongue, posteriorly, where the superior surface and the border joined. The edges of the base were hardened, thickened and raised above the level of the tongue. There was a slight discharge from the ulcer, occasionally small traces of blood, but at this time no odor. Speech was slightly indistinct and salivation intermittently troublesome. On the inside of the cheeks were leukoplakial patches, scattered at intervals on both sides of the mouth. Externally, anterior to the sterno-mastoid muscle, could be felt a large lymphatic gland, tender to the touch, and below this several other smaller involved glands. On swallowing, the patient complained of a rawness and burning sensation, evidently located in the neighborhood of the ulcer. About December 17, 1915, he had a severe attack of grippe which produced an aggravation of all of the local symptoms. To make matters worse, he had great myo-cardial weakness with mitral insufficiency, and the grippe poison increased this weakness to such a point that cardiac dilatation occurred. Unfortunately, on January 6, 1916, he caught more cold and had a repetition of the grippe symptoms of December

17th, and he came near passing away. From this time until the date of his death, March 4, 1916, it was simply a question of keeping him as free from pain as possible, maintaining as good a circulation as one could under the circumstances and taking care of the paretic intestines. Early in his illness I consulted several of the best radium experts in Baltimore, as I hoped to arrest the disease in this way. While radium emanations applied to malignant disease of the tongue with glandular involvement had been followed in some cases by an arrest of the lesion, in others it had, unfortunately, resulted in an intense aggravation of the disease and increased growth—instead of checking the process—and thus additional suffering ensued.

Owing to the age of the patient, his cardiac and abdominal complications, surgical measures, such as the removal of the tongue and involved lymphatic glands, were out of the question. Once this idea of either surgical or radium relief was abandoned, there remained only the problem of relieving pain in the two regions—one at the site of the epithelioma, and the other, externally, in the glands and in the fifth nerve of the affected part. The internal pain was aggravated by any attempt at swallowing, whether of food, drink or saliva; the facial pain extending up to the vertex was produced and increased by any sudden movement of the head or neck and became very intense at night. For these external pains I prescribed Iodin, in the form prepared by Sharp & Dohme, and called by them "Surgodine," in three drop doses in a wineglass of water twice daily after lunch and after dinner. This remedy acted well for a while, diminishing pain and reducing the swelling of the glands, and then lost its effect. The violet rays were then applied all over the face, neck and scalp of the affected side, and for a time afforded relief. Aspirin, in five grain tablets, for two doses, an hour apart, was tried for several evenings for this nocturnal pain, but had to be discontinued because of the depressing effect upon the heart action. In the meantime, the ulcer and its indurated base increased greatly and rapidly in size; the hard tumor mass extending chiefly in the anterior direction—both upon the dorsum and the right border of the tongue. At this stage of the disease there was a foul smelling discharge of pus, blood and debris from the surface of the ulcer, speech was painful and most indistinct. The infection had now extended from the cervical glands to the submaxillary and mental glands; these glands exhibited great tenderness on pressure

of the finger and on the slightest motion of the head and neck, the most agonizing pain developed radiating throughout the branches of the fifth nerve, but, independent of any of these exciting causes, the pain—evidently of toxic origin—usually set in every evening about six o'clock. Swallowing of food or drink was accomplished with the greatest distress and the patient naturally delayed the taking of nourishment to as infrequent intervals as was possible; this soon led to rapidly increasing weakness. The pain produced by the ulcer was now so severe as to necessitate local anodyne measures. Insufflations of Morphia and iodoform, orthoform lozenges, novocain solutions were all tried without obtaining relief. At this time it occurred to me that the hydrochloride of quinine and urea might prove of service; so a one-quarter of one per cent. solution was prepared and applied to the ulcerated surface under the guidance of the laryngeal mirror. This application not only relieved the greater part of the pain, but the local anesthetic effect lasted for six or seven days. The solution was not used in greater strength because of its well known tendency to set up cellular infiltration, with induration of the tissues. The action of this remedy is all the more remarkable when one considers that half a grain of morphia without atropia given at night, did not relieve the pain for more than a few hours. The method of applying the solution is very simple. A small piece of cotton wrapped securely around the tip of a laryngeal probe, which is bent sufficiently to correspond with the curve of the lingual base, is used to wipe away all secretions from the surface of the ulcer. A fresh piece of cotton dipped in the solution of the hydrochloride of quinine and urea is then gently, but firmly, applied to all of the ulcerated area and its adjoining region. These treatments should be given about every sixth or seventh day, according to the tendency of the pain to become severe again; a little experience will soon enable us to keep the patient comparatively comfortable by regulating the exact day for the subsequent applications.

I have endeavored to avoid troubling you with many details in this case, because the chief reason in presenting this preliminary note is to suggest to our members that the hydrochloride of quinine and urea may be useful for other purposes than as a local anesthetic in tonsillectomy. The point is, will such a solution as this afford every sufferer from epithelioma as much relief as it did this patient, and might it also be of service in the ulcerative stages of laryngeal phthisis?

THE RELIEF OF PAIN IN MALIGNANT DISEASE OF THE THROAT.

These two maladies affecting the throat can give rise to excruciating suffering, and it might be worth while for some of the members of this society to give this remedy a trial—if they have not already done so—and report the results of the experiments to us next year.

905 No. Charles.

DISCUSSION OF DR. SHEARER'S PAPER.

G. J. ALEXANDER: I am pleased to have the advantage of this opportunity to learn that there is another use for the quinine urea combination than in local anesthesia for removal of the tonsils. One experience with it for that purpose was enough for me, mainly on account of the post-operative soreness, edema and sloughing.

W. F. BEGGS: Why should it not work as well for operative procedures? I have used Quinine for that purpose. Abdominal surgeons often use that solution along the rectus abdominalis muscle when they sew up the incision. Why would it not be a proper plan to use a weak solution after tonsil operations? I would like to know whether any members have tried it.

T. L. SHEARER: I have never tried it but it seems to me that on a fresh, raw surface you might get a good deal of it absorbed. With unbroken epithelium there is not so much risk of that taking place. I should be rather afraid of putting it on raw surfaces.

W. F. BEGGS: After 24 hours a membrane forms. Why would it not be safe to use after 24 hours?

T. L. SHEARER: I would suggest a weaker solution for that purpose, say, one-tenth of one per cent.

HEYWORTH: I have used but thought it favored hemorrhage.

METASTATIC CHOROIDITIS FOLLOWING MASTOIDITIS.*

H. D. SCHENCK, M. D.,

Brooklyn, N. Y.

THIS CASE is reported because of the number of points of interest attached to it and because no cases have been found by the writer where choroiditis has followed mastoiditis. There are several factors in the case that make it one for fruitful discussion as to its etiology and pathology.

The case was a woman of 38 years, married and having a child 11 years old, who was first seen on January 23rd, 1916, presenting the following history:

During the night of the 20th she had a violent earache on the left side, which quieted down in a marked degree toward morning when the ear began to discharge. Earache during most of her childhood had been very common, and she thought this to be a return of her old ear condition. She had never had treatment as a child and did not think it would be any more necessary during the present attack. She never had suppurative otitis, however, in childhood. It returned again on the night of the 21st with more severity than before, and the mastoid began to be tender. Dr. Robinson, the family physician, was called to see the case on the 22nd and asked the writer to see it on the 23rd. There had been some delirium the night of the 22nd with a temperature about 104° , with a moderately free discharge from a posterior-inferior perforation. There was a very tender point about one and one-half inches posterior to the auricle and about on a line with the auditory canal. The other parts of the mastoid showed little redness and tenderness and no swelling. The pus was freely vacuated by the use of an otoscope, and this gave the patient a very good night. She had a bad night again on the 24th, with high fever and more delirium early in the morning of the 25th. It having been decided that an operation was advisable at once she was removed from her home that forenoon and operated early in the afternoon. The dis-

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charge was shown to be almost a pure streptococcic infection. There was only a small amount of pus in the antrum but the posterior cells were filled with pus so that it was necessary to make a posterior incision and remove the bone nearly one and one-half inches back of the auricle. The dura was exposed fully and found to be normal. The sinus was also explored for some distance and found in a normal condition. Before she came out from under the anesthetic the cerebro-spinal fluid was drawn through a lumbar puncture and was found to be sterile and to show no increased cells although it was thought to be under some pressure. The case reacted rather slowly and continued to have a fever for ten days, but the mastoid healed with remarkable promptness and without any untoward symptoms.

On the morning of the 25th before her removal to the hospital the pupil of the right eye was quite a little larger than the left. This inequality of the pupils continued all the forenoon. The right eyeball was injected, and pus in slight amount was being secreted from the blepheral conjunctiva. In twenty-four hours this had proved to be a deep-seated inflammatory condition which the writer hoped would be an orbital-cellulitis with an abscess in the orbit outside the eyeball. It proved, however, to be a choroiditis or a chorio-retinitis which rapidly developed into a panophthalmitis with rapid destruction of the eyeball. Pus appeared the second morning in the anterior chamber and on the surface of the iris, and a rupture of the eyeball occurred about 5 mm. posterior to the outer corneal border two days later. The next day after the scleral break the cornea ruptured and the eyeball was found completely filled with pus. This was reported by the pathologist to be a pure streptococcic infection. There was little or no pain at any time in the eyeball, and while the patient was recovering from the shock of the mastoid operation and her temperature was subsiding, it was decided to let the eyeball remain as it was. She was finally in a condition when it was deemed unwise to make an enucleation, as after the mastoid operation she made a good recovery from the anesthetic, and the case came along in about the usual course.

This woman had not had trouble with her ears since she was a school girl and had not had la grippe, although her illness occurred in the midst of the epidemic last winter. She had no signs of trouble with the ethmoid cells or any other nasal condition that might have furnished a nidus for the infection of her middle ear unless it be an

anterior septal spur on the left side. She had been in good health, although somewhat broken of her rest, because her child had been ill for eight days with a mild attack of scarlet fever. The mother had nursed the child whose attack had been without complications. As the mother had had a light attack of scarlet fever when a child, this was not thought of as a cause at this time, but later it was suggested that this might have been an irregular case of scarlet fever which manifested its effects almost entirely upon the ear. It is well known that scarlet fever leaves more severe lesions of the ear than any other of the exanthemata. There are certain facts that give some ground for this supposition. The temperature remained rather high for four or five days after the operation, and there was a rather profuse desquamation from the hands and feet afterward which lasted for a number of days. It would seem also that the delirium which took the form of seeing flocks and animals floating in the air, and the temperature which ran up to nearly 105° , could not be accounted for by the mastoiditis. This is one of the points in the etiology which needs discussion, and it is hoped that much may be brought out. It is doubted by the pathologist who examined the specimens and by Dr. Lloyd who assisted at both operations, that the mastoid condition was responsible for the metastatic-choroiditis. It seems to the writer, however, that while they deny this origin, their criticism is absolutely negative as they do not offer any other source from which the choroid could have been infected.

When the mastoid was just closing she had an attack of facial erysipelas which extended across to the other ear before it was checked. It began near the mastoid wound. It shows the deep streptococcic infection, which this case had at the time.

Fuchs says: "In metastatic ophthalmia it is the pyogenic bacteria that so act. The inflammation that they produce is allied, both clinically and anatomically, to the ordinary form produced by an ectogenous infection. A distinction is found in the fact that in the latter case the inflammatory agents act first on the inner surface of the coats of the eye while in metastatic inflammation they start from the blood vessels, into which they have been carried by embolism, and act upon the surrounding tissue. About the embolic spot in the retina or choroid a focus of inflammation is formed which rapidly leads to the formation

of pus and to necrotic disintegration of the tissues. From this primary abscess the inflammation extends with great rapidity so that in the shortest possible time the whole interior of the eye is involved in the suppuration and the pus soon breaks through to the outside of the eye (panophthalmitis).” “The emboli which produce a metastatic inflammation are, as a rule, of a capillary character, and they affect the vessels of the retina more often than those of the uvea. The bacteria concerned are the streptococcus, pneumococcus and other bacteria.”

Weeks says: “From a suppurative process taking place in some distant part of the body a minute mass of pyogenic or pathogenic micro-organism may enter the circulation and be conveyed to the choroid of one or both eyes; a plastic, suppurative or tubercular choroiditis, according to the character of the micro-organism, is the result. Ulcerative processes in the alimentary canal, in the genital tract, or on the skin may be the foci, from which micro-organisms proceed by way of the blood to the choroid. The metastasis may occur in cerebro-spinal meningitis, puerperal fever, pyemia, small-pox, pneumonia, influenza, erysipelas, cholera, malignant pustule. It has been observed accompanying ulceration of the umbilical cord of the new born. In some cases no focus or origin could be discovered.”

Norris and Oliver state: “Purulent choroiditis may also occur as a metastatic affection, when both eyes are often attacked, one shortly after the other; in surgical or post-partum pyemia, especially in the latter, and in septic endocarditis likewise, but usually in a less acute form; at the termination of certain acute disorders, as influenza, scarlet fever, measles, diphtheria, scorbutus, variola, etc.; in erysipelas, typhoid, pneumonia and cerebro-spinal meningitis epidemic or sporadic.”

Parsons says: “Metastatic suppurative choroiditis is a comparatively rarely observed phenomena, possibly owing to the gravity of the cases in which it might be expected to occur. It is found particularly in septic puerperal cases, as well as in surgical pyemia and after acute infectious diseases. It was first investigated by Meckel, Muller, later by Virchow, Roth, Litten, Heiburg, Hirschberg, and others. It is usually due to streptococci, more rarely to staphylococci or pneumococci; the intensity of the virulence diminishes in the order named (Axenfeld). The organisms form emboli in the small vessels or capillaries, or escape from them into the surrounding tissues. Since

the retinal capillaries are much narrower than the choroidal (5-6u): (10-30u), the retina is generally first attacked. When clinical grounds render primary affection of the choroid probable, it usually starts in the anterior part where the capillaries are narrowest (Axenfeld). In most cases both membranes are involved, and it is impossible to decide the primary site.

"It is often impossible to demonstrate the organisms after death, as they usually disappear rapidly. When found they are most numerous, not in the choroid, but between the pigment epithelial cells, in the retina, and in the vitreous, especially in the pus. Herrnheiser found the choroidal vessels full of streptococci, whilst the surrounding tissues were quite normal; this can only have been due to multiplication shortly before or after death, when inflammatory reaction was no longer possible."

The writer feels that this was a case of metastatic choroiditis where the focus of infection started from the streptococcic infection of the mastoid. There seems to be no other logical way to account for the condition. He is also inclined to think that this may have been an irregular case of scarlet fever. Cases of scarlet fever beginning with fever and delirium where the only other symptom was desquamation have been reported. It seems that it is more logical to account for the high temperature and delirium arising from this cause than from the mastoid where no meningeal or sinus complications were found.

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DISCUSSION OF DR. SCHENCK'S PAPER.

DR. CHARLES LESLIE RUMSEY: With the report of desquamation and nursing a child with scarlet fever, I would confirm Dr. Schenck's diagnosis of atypical scarlet fever. As Dr. Schenck reports the ear discharge showing "almost pure streptococci," the high temperature and delirium could be caused by the mastoiditis or the atypical scarlet fever. Cushing states that in cranial affections a lumbar puncture will quickly show an excess of leukocytes and possible bacteria; that in posterior basic form of meningitis, the lumbar subarachnoid fluid may remain sterile. With the thorough exposure and drainage of the area of infection, the process was checked and purulent meningitis prevented. While affections of the uveal tract are much less frequent

in the course of eruptive fevers than affections of the conjunctiva or cornea, eye complications may occur at any time. I take the eye complication to be a metastasis where the infection had been carried, unfortunately, by the blood to the eye at the same time as to the ear. I do not believe it came from the mastoid, as believed by Dr. Schenck, as the thoroughness of his surgical operation and drainage prevented meningitis, thus preventing the pus traveling down between the sheaths of the optic nerve and then passing into the subarachnoid space, which would directly infect the choroid. To confirm Dr. Schenck's view that the eye infection came from the mastoiditis, it would have followed the mastoid operation rather than be concurrent with the mastoid infection, as is shown by the injection of the right eye, and pus secretions, on the patient's removal to the hospital. I believe both the ear and eye involvement came through the nasal and pharyngeal route, infected by scarlet fever.

This case emphasizes the necessity of examining all discharges at once for accurate diagnosis. May I ask Dr. Schenck if he would not have performed the mastoid operation at once—with almost pure streptococci in the discharge—if he had made the examination of this discharge at the first consultation? It is always advisable to make examination of both eye and ear discharges at once, and thus prevent a possible serious outcome.

2nd. I would supplement this with the necessity for a fundus examination, particularly when the patient became delirious.

3rd. As Dr. Schenck has written me that there was an attack of erysipelas beginning about the mastoid wound when it was almost healed, this would again show streptococci infection, and suggest the need for early examination of the blood for streptococci. To my mind this establishes the diagnosis of metastasis by the blood current, not from the mastoid.

In conclusion, while intravenous normal salt solution and streptococci serums have been recommended for these septic cases, I successfully used, in a septic case, one-tenth of one per cent, formalin in normal salt solution intravenously. The temperature immediately became normal, and the patient had an uninterrupted convalescence.

THE RELATION OF EYE DISEASES TO DISEASES OF THE ACCESSORY SINUSES OF THE NOSE. A REPORT OF A STUDY OF ONE CASE.

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A GREAT deal of interest has been centered recently in untoward eye and orbital conditions that are traceable to ectasias and inflammations of the accessory sinuses of the nose. The importance of this relation may be judged by the great length of time consumed in clinical discussions of it to-day, and the more general attention of the ophthalmologist to the examination of sinuses in his work.

Every case in ophthalmic practice, where the accessory sinuses of the nose are held accountable, is studied carefully, and records kept of the treatments and findings many times during the course of the disease, with the purpose of reporting them at some future date.

The interest in these cases is increasing, and as a sequence examination into the condition of the accessory sinuses is made more frequently than heretofore, with the result of a surprising number more eye diseases found traceable to them on this account.

What then are the eye conditions that should prompt us to examine the accessory sinuses of the nose?

- (1) A monocular exophthalmos.
- (2) A monocular rapid loss of vision.
- (3) A monocular papilledema.
- (4) A monocular edema of the lids associated with severest headaches.
- (5) Asthenopic symptoms where the eye conditions are not found responsible.

When any one of the above five conditions occur, an examination of the accessory sinuses of the nose becomes compulsory with the idea of excluding them as a causative factor, or treating them, or operating them, as the case requires if found involved.

The most pronounced symptom of orbital inflammation, or orbital

encroachment, is exophthalmos. Statistics tell us that 60 per cent. of the inflammatory kind (orbital cellulitis) are traceable to sinusitis and the mortality in these cases is 17 per cent. On this account examination of the sinuses becomes imperative in any monocular exophthalmos. The sinuses responsible in point of frequency are, the frontal, anterior, ethmoidal and maxillary, and our finger may be placed upon the ones involved by the character of the displacement of the globe. In frontal sinus ectasias, or inflammations, the globe is pressed forward, downward and outward; anterior ethmoidal involvement displaces it forward and outward, maxillary forward and upward.

The next most frequent eye condition in which the sinuses may be blamed, is the rapid failing of vision in one eye without observable fundus changes (retro-bulbar neuritis), but there exists a central scotoma and again in other cases are found inflammation of the optic nerve and retina, also thromboses. The sinuses that are most likely responsible are located along the optic canal and in intimate relation with the nerve itself, the sphenoid and posterior ethmoid.

Inflammations or ectasias of these sinuses are seldom responsible for exophthalmos.

Monocular papilledema varying from a blurring of the margins of the disc at the entrance of the vessels to a measurable elevation of the edema, may be seen in orbital inflammations and encroachments depending upon the pressure applied upon the optic nerve envelopes.

Asthenopic symptoms when the error of refraction, extrinsic muscular imbalance, inflammations of the eye or adnexa are excluded as a cause, the accessory sinuses ought to be examined and occasionally may be found responsible.

In conclusion, I will say that the early recognition of inflammations or ectasies of the accessory sinuses of the nose as a causative factor in orbital inflammations and encroachments, and the proper treatment administered, may prevent many a case of monocular blindness, and in some instances loss of life.

The following is a report of an interesting case:

Margaret Salamander, a daughter of Italian parents, age 9.

Family history negative. (Father 38 years, mother 32 years, four sisters and three brothers living and well.)

PERSONAL HISTORY.—Had typhoid fever at the age of five; sick

three months: no sequelæ from the fever that they know. No other sickness until present trouble.

PRESENT HISTORY.—On February 23, 1916, patient came to my service at the hospital complaining of pain in left eye, which she had for a few days. On examination, the globe protruded forward and outward, and there was a divergent squint of fifteen degrees. Eye motions were impeded. The lids were purplish and would not close by about one-fourth of an inch.

When the eye was pushed backward into the orbit, grasped by the thumb, index and middle finger, it met with resistance and returned to its original abnormal position upon releasing the pressure.

Eye fundi were examined and the left showed a blurring of the upper, lower and nasal margins of the disc from edema, right fundus was found to be normal.

Vision in left eye was 20/200, in right eye 20/20.

The case was referred for a sinus examination and the following is a report: Transillumination did not show any pathology. X-ray pictures were taken and the plates showed a large ethmoid sinus on the left side. No other pathology was indicated on the plates.

There was tenderness upon pressure over the left anterior ethmoid region. Upon inspection of nares right side was found normal. Left side showed the middle turbinate congested and pressing upon the lateral wall and septum. After cocainization and adrenalization, creamy, purulent matter flowed down between the middle turbinate and lateral wall.

Patient was admitted to the hospital. Hot applications were applied to the eye at stated intervals and steam inhalations were given at the same time. Left nares were cocainized and adrenalized once daily.

In this case there was little doubt that an empyema of the left ethmoidal sinus existed which distended it and the contents were dammed back because the ostium of the cavity was shut off.

Patient remained in the hospital five days under the treatment just outlined, and at the end of this time the exophthalmos disappeared, fifteen degrees divergence disappeared, eye motions returned to normal, left disc nasal margins cleared and vision returned to 20/20 in the left eye.

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EAR COMPLICATIONS OF THE EXANTHEMATA.

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THE TOPIC I wish to take up for discussion is the otitic complication of the exanthemata. I shall limit the subject further to measles, scarlet fever and diphtheria. In the very nature of things with the short time at my disposal I can not attempt a detailed discussion of all the various ear complications that may arise. My attention has been forcibly drawn to this subject as a result of some recent experiences in looking after the ears and throats of some such patients. In noticing the care given the other patients, I was struck with the fact that there was no routine examination made of the ears. Hence my paper will be primarily a plea for a more frequent, routine examination of the ears in all exanthematous cases. If I shall succeed in emphasizing in your minds the crying need of such care I shall feel well repaid.

As to the percentage of ear involvement in the different diseases we find wide variations with different authors. This will depend, of course, upon just what we mean by ear involvement. The old classification of catarrhal and suppurative otitis media leaves room for discussion. Some only include those cases that have earache or discharge. Now there are many in which there will be no pain, no discharge, and yet inspection will show a beginning otitis media, which, either because of the patient's good resistance or to the lack of virulence of the invading organism, never go on to the more active state. These are none the less cases of ear involvement, yet they will not be recognized unless careful inspection is made. However, I will give you the statistics for what they are worth. Remember that most statistics include only the suppurative cases in otitis media.

Finlayson found otitis media present in 10 per cent. of 4,397 cases of scarlet fever. Caiger found it present in 11 per cent. of 4,015 cases. Burchleart in 33 per cent. of his scarlet fever cases. At the South Dept. of Boston City Hospital "middle trouble" was found in 18 per cent. of 5,000 cases. Where scarlet fever and diphtheria co-exist, a

quite frequent condition, it is stated that otitis media develops in 50 per cent. of the cases.

Being interested in getting more detailed information than is available in most text-books, I wrote a number of hospitals asking several questions.

Thus in Hospital A., where the ears are examined every day, there was found an otitis media in 33.6 per cent. of cases of measles, 16.6 per cent. of the cases of scarlet fever, 6.7 per cent. of the cases of diphtheria.

In Hospital B. the examination was on admission and thereafter only on days in which there was a rise in temperature which might be attributed to the ears. Here we find otitis present in 17 per cent. of measles, 12.7 per cent. of scarlet fever, 2.4 per cent. of diphtheria.

In Hospital C. a routine examination is only made during the acute stage of the septic cases, *i. e.*, those with a profusely discharging nose. Here we find otitis media present in 10.3 per cent. of scarlet fever, 5 per cent. of diphtheria.

We note then that the percentage of otitis media varies directly with the thoroughness of the routine examination.

I found that in measles the discharge begun in 93 per cent. of the cases before the fifth day.

In scarlet fever 86 per cent. of the cases begin to discharge during the first week. In diphtheria practically all occur in the first week.

Next the question of incision. In Hospital B. all cases have an incision of the tympanic membrane to insure free drainage. Only 2 per cent. developed mastoiditis (had mastoid operation) in measles, 5 per cent. of the scarlet fever cases developed mastoiditis (2 per cent. of which were clinically present on admission), 1/10 of 1 per cent. occurring in diphtheria. Very rarely do patients go home with discharging ear.

In Hospital C. only 10 per cent. of the cases are incised. Three per cent. developed mastoiditis in scarlet fever, none in diphtheria. Eighteen per cent. of the scarlet fever cases, 11 per cent. of the diphtheria cases left with a discharging ear.

Hospital A. did not give data on this point, although 43 per cent. of the measles cases, 70 per cent. of the scarlet fever cases and 37 per cent. of the diphtheria cases were incised.

We notice then that where there was a high percentage of in-

cisions there was a much smaller percentage who left the hospital with discharging ears. In none of the hospitals was there given any routine treatment to the nose, so that they were all on a par in this respect.

There are many other problems that enter into this question, such as the length of stay in the hospital, but I could get no data on this point.

I have most carefully consulted a number of general books on scarlet fever and measles. With few exceptions you will find some such direction, "The nose and throat must be carefully sprayed with Hydrogen Peroxide, Glycothymoline," etc., the exact medicant, of course, varying. That this was a routine practice with the majority of the profession in the past and is still with many there can be little doubt. To be sure it would seem to be a logical treatment. The nose and throat are primarily affected hence they should be treated.

However, this pretty little theory is not borne out in practice. As a matter of fact in cases where active treatment to the nose and throat is carried out, instead of having less ear involvement, we actually find that we have more cases of otitis media. In other words, our nose and throat treatment have simply carried the infection up the Eustachian tubes, thus increasing the number of cases of ear trouble. This fact has now conclusively demonstrated in a number of first class contagious disease hospitals. Therefore, leave the nose and throat alone. Don't treat them; only if the nasal discharge be very profuse should saline irrigation or argyrol be used.

Another common statement in works on general practice is: "If pus becomes pent up in the middle ear until there is great tension and pain it must be punctured." The science of otology has made some very rapid strides in the last few years. It is particularly in the septic complications of otitis media that perhaps most progress has been made. We have learned absolutely never to allow pus to become pent up in the middle ear. If you will recall your anatomy, there is a natural opening from the tympanic cavity back into the mastoid antrum. Small wonder then that the infection, which has already traveled up the Eustachian tube to reach the middle ear, easily passes back into the antrum. Hence we find that a large percentage of apparently otitis media cases are in reality mastoiditis. This has been borne out by the researches of Politzer and others, who have shown that in a large percentage of patients presenting clinically only the symptoms of otitis

media pus has already travelled back into the antrum. These then are cases of mastoiditis. As long as the aditus ad antrum remains patent there may be no pain, no temperature, nothing but the discharge to indicate that there is anything wrong. Even if there are some symptoms they may be masked by the general disturbance.

Another thing we have learned is that although there may be free discharge from the external auditory canal, the diseased process may be steadily involving the mastoid bone. If this condition extends internally we will get labyrinthian disturbances, as suggested by nystagmus, vertigo, sudden deafness, nausea, vomiting, etc. As to the percentage of labyrinth involvement in scarlet fever, measles or diphtheria I do not believe we have any reliable statistics.

Now then to repeat. In every case of otitis media, have in your mind the very likely mastoid involvement. Do you wonder then that as an otologist I hold up my hands in horror at the statement I quoted, "If pus becomes pent up in the middle ear until there is great tension of the tympanum, it must be punctured?" In view of the baneful results that often follow scarlet fever, measles and diphtheria, let me paint before your eyes in blazing red letters two nevers:

1st. Never puncture an ear drum. Puncture is a word no longer mentioned in polite ear societies. Don't puncture. Make a free incision. Have no fears that the incision will leave a permanent opening. Perforations come from necroses following neglected cases, not from surgical incisions.

2nd. Never allow pus to become pent up in the middle ear. Remember the ever present danger of pus in such a dangerous region, and remember the serious consequences of delay. Incise early. If your case of scarlet fever tells you, to your surprise some morning, "Doctor, my ear leaks," then feel like hiding your face in shame; that patient's ear drum should have been incised.

This then brings to many of you this question: how am I to know when my patient has a beginning otitis media. While there are many symptoms of otitis media, there is only one sure way of diagnosing the condition, *i. e.*, using light with a head mirror and ear speculum. In no other way can we be certain of the presence of this condition. Unless one is able to use a head mirror and interpret properly what he sees, it will be impossible to tell the condition of the ears with any degree of accuracy. Some of you may smile at the idea of anyone

being unable to use a head mirror, but after having spent several years in the practice of this specialty, and after having been called in consultation with other physicians many hundreds of times, I know well that many doctors are still unfamiliar with the use of the head mirror. To such I can only say, familiarize yourself with it. Use it on all patients until you are well acquainted with the appearance of the normal tympanic membrane.

In an otitis media, the drum, instead of being a pearly white, will have become reddened, either in whole or in part. If there is any redness of the drum it must be watched very closely, preferably three times daily. In the nature of things this will usually be done by the interne, provided the patient is in the hospital. If only a part of the tympanic membrane is reddened without any bulging of any part of the drum, and with no signs of mastoid or labyrinth involvement, it will suffice to treat the ear, watching it very closely however. Many such cases can be carried along without any further involvement. It is probable that a far larger percentage of ears in the exanthemata have such a congestion than we suspect. If treatment is begun early, much can be accomplished and many serious involvements prevented. Where the triangular light spot will still be slightly visible, there may be but little pain, and yet there will be bulging of pus in the superior part of the middle ear. Incise these cases at once. One must be on the lookout for these cases, and they are by no means infrequent.

In the more advanced cases of otitis media all the tympanum will be reddened. Much care is required in noticing the exact condition of the drum. You may have a slight pink congestion, the form of the drum and the shape of the malleolus handle being still clearly recognized. These cases in the presence of headache, pain on pressure over the mastoid nystagmus, signs of labyrinth irritation, require a full incision of the tympanum. In view of destructive results we see so frequently, I feel that if there is any doubt, it will be wiser to decide in favor of free paracentesis.

While I have spoken at some length as to the condition and appearance of the tympanum, do not be deceived. In no case is it more important than here to get and depend upon the totality of the symptoms before arriving at a conclusion. You may have but slight evidence of trouble on the tympanic membrane and yet have considerable involvement in the middle ear. We may also get almost all the

primary trouble manifested in the mastoid cavity. However, these cases are the exception. In case of doubt, indeed in case of trouble at all, I most firmly believe that an otologist should be called into the case. There is no one element that goes to make up the diagnosis that is essential for the diagnosis. In other words, all signs at times will fail; only one who can read and interpret all the symptoms should be depended upon.

Lastly, in those cases in which the tympanic membrane is deeply red, its form obliterated, there is but one thing to do, and that independent of whether there are indications of further trouble present or not, incise freely. Never depend upon simply puncturing the drum. A free incision must be made.

Now there is a large class of cases in which on our first visit we find the ear discharging, and quite freely. In such a case clean out the canal until you can see the opening in the tympanum. If this is found to be very small and possibly barely discernible, or in a poor position for drainage, or is found to be a nipple perforation, it must be enlarged by making a free paracentesis.

MASTOID PROBLEM.

Now briefly as to the mastoid question. If possible this should always be settled by an otologist. Lack of time permits me to mention only a few of the indications for opening the mastoid. Inasmuch as 93 per cent. of the otitis media cases in measles develop on or before the fifth day, and 86 per cent. of the otitis media cases in scarlet fever develop during the first week, the question of temperature is likely to be masked by the temperature going with the disease. As you all know, fever is a very unreliable symptom. Many cases of mastoiditis show no rise in temperature or at most not over 100. However, in those cases running a normal or low temperature, any sudden rise should suggest the ears as one of the possible sources of the infection.

PAIN.

There is quite constantly pain often of a deep boring type either in or back of the ear. There is frequently pain on pressure over the tip of the mastoid. Unless there is bulging back of the ear, the pain on pressure is usually slight, and in a large percentage of cases may be absent entirely. Beware of a cervical lymphadenitis, which may simu-

EAR COMPLICATIONS OF THE EXANTHEMATA.

late a mastoiditis. Unfortunately many cases complain of but little or no pain.

BULGING BACK OF THE EAR.

This symptom is classic of mastoiditis, and usually indicates that there exists a fistula down into the mastoid cells. A cervical gland swelling might be deceiving, but it begins below and runs up.

Bulging of the posterior superior canal or ear. This symptom usually calls for mastoid operation. Of course, there may be so much cellulitis in the canal that very little more can be made out. But where there is free discharge and pain with bulging of the posterior superior wall of the canal the patient usually will require a mastoid operation.

HEARING.

This is a question that should be taken carefully into consideration in every case of otitic suppuration. Absolute deafness indicates a suppurative labyrinthitis. In any case there is usually diminished hearing. If this becomes great so that a loud spoken voice can only be heard at 1 m., or if the deafness is steadily increasing and the discharge is still unchecked, it will often be advisable to operate to preserve the hearing. Now this is a matter I feel is not given enough attention. In any case of a discharging ear that runs for four to six weeks with no marked let up in the amount of discharge, we will undoubtedly find that we have a mastoid involvement. If we find also that the patient is getting progressively more deaf, I feel that we have sufficient grounds to consider seriously a mastoid operation.

The X-ray will often be found of great value; however it is usually not applicable to infectious cases.

TREATMENT.

The prime factor is prevention. Statistics show most conclusively that in those cases free of adenoids and diseased tonsils there is much less liability to ear involvement. Hence the throats of all children should be kept in as nearly normal condition as possible.

In the incipient stage hot saline or boracic irrigation to the affected ear will be found very agreeable. A solution of 5 to 12 per cent. of carbolic acid in glycerine, warmed and dropped into the ear will afford great relief. This can be repeated every 3-5 hours if needed. If these measures do not relieve the pain incise the tympanic membrane freely, repeating the incision as often as needed to keep a free opening. After

incision use free irrigation with saline, boric or soda solution every 1-3 hours, as needed; at least three times a day follow the irrigation by instilling 20 per cent. sol. of argyrol.

Finally, I come to the point that I consider, next to paracentesis, of most importance, *i. e.*, the correctly selected remedy. There seems to be a habit of sliding over this part of our papers. I do it also, first because I do not believe one can remember many of the symptoms presented in a paper; secondly, because you probably have them in books better than I can give them. The remedy, however, is of very great importance. In the first stage I depend chiefly upon Acon., F. Phos. or Bell. Capsicum is often indicated when mastoid tendencies are prominent. Then, later, I believe I use Puls., Mercurius or Hep. Sul. more frequently than any others. As the cases become subacute or chronic the range of remedies is greater. Merc. Dul., Kali Mur. will often prove of value. One, of course, can not follow any set scheme absolutely at any stage. However, I have always found such a plan of some assistance.

Finally, all ear cases should have their hearing accurately tested. If this is found defective, give treatment at once. In this way much of the deafness that often follows these diseases will be overcome.

In conclusion, inspect the ears of all your exanthematous cases. If you do not, you will fail to detect *any* of the cases of otitis media in their incipency, and will overlook a large percentage of the cases that do exist. The earlier you start treatment the better your results will be.

Then incise cases early, and keep on incising as soon as the opening gets small or is found to be in a bad position. This will result in a much less number of cases of chronic otorrhea following the exanthemata.

Lastly, don't think that all patients need a mastoid operation. However, remember the Good Lord did not make the aural appendage for a pencil rack, but made it to hear with. You may be able to serve your patient's interest much better by operating than by letting him go through life with a deaf ear.

DR. BENTLY (closing the discussion): I appreciate your kind remarks. I did not expect all to agree with me. There are some points about which we all differ. One is still that question of treatment of the nose. I think it is true that thus far the specialist has

not had much to do with contagious diseases. The majority of men do not visit any more than they have to the contagious diseases; but I have been in correspondence with the best contagious disease hospitals, and they were unanimous that there should be no routine treatment given the nose. Statistics show far better results if you leave the nose alone. This is not my opinion—it is the opinion of those who are treating the cases in the contagious hospitals. It is the unanimous opinion of all the contagious disease hospitals to which I wrote. They do not make any routine treatment of the nose.

Now, the question of local anesthetic before lancing the ear. This is nothing new that I am going to mention, but I have not often seen it mentioned: equal parts of cocain, camphor and menthol, the three making an oil, the best local anesthetic we have for use in these conditions. The point that makes it of value is that it must come in contact with the tympanic membrane. Some paint it on, and others drop it in the ear. If you drop it in the ear, you will sometimes find a little spot where the ear is not anesthetized. You will find the membrane is not blanched. Only if it is blanched, can you make a painless paracentesis. Now, that is an important item. If it is not blanched you haven't anesthesia. I have never seen any bad results following the use of this anesthetic where it was used only for opening the drum. It can not be used repeatedly merely to stop the pain of the earache. I do not believe in ether; I prefer gas, although there is a condition we call primary ether anesthesia which is not as bad. I was surprised to find a man who had never heard of primary ether anesthesia. It is the stage that you get before you get the stage of excitement. You have an anesthesia lasting about one to two minutes. It takes a very good anesthetic for such cases. In cases having nephritis or bronchitis I prefer the gas.

One more point, and that is the use of adrenalin. There is one point I think ought to be mentioned. The majority of men use it in 1:1,000 solution. I never use it in this strength except for the acute blanching for office treatment. I never use it in any chronic condition under 1:8,000. You will get as good results without the bad sequelæ.

I still maintain that I do not believe in treatment of the nose. When children have profuse discharge from the nose, you will find usually that they have adenoids. These cases can be operated in the sub-acute stage while still in the contagious hospital. You will find

that in the cases showing the diphtheria organism present, and those where there is a very profuse discharge, argyrol is occasionally used, but I think instead of using it on tampons it is better to drop it in the nares in this class of cases.

Now, the question of adenoids. The operation can be done in sub-acute cases, and quite a number of men are taking out adenoids and tonsils, if necessary, during sub-acute stages, especially those cases having a persistent positive diphtheritic culture.

Now, the question of homœopathic remedies. I believe in them, and I believe strongly that we ought to have our attention called to them. It is so much easier to mention the surgical aspects; you cannot remember the remedies after you get out of the room. It brings in this proposition: I believe in the remedy, but there are lots of cases which the remedy will not touch, and those cases need operation. All tonsils do not have to be taken out, but some of the diseased tonsils resist treatment, and I have seen them treated by homœopathic specialists, and I have seen these cases that were carried on under internal medication for one, two and three years, and still not cured. That is no indication that we want to throw medicine aside, but it shows us that homœopathic prescribing will not clear up all cases, and the cases that are not cleared up ought to be cleared up by surgical measures. Where the adenoids have to be taken out a number of times, I think we find a good field for homœopathic prescribing, because here a constitutional diathesis which can be corrected by the internal remedy. But the point is, the condition must be cleared up; if you cannot do it in one way, do not fail to do it in another.

Detroit, Mich.

A CONSIDERATION OF PYORRHEA AND THE RATIONALE OF A NEW REMEDY, WITH CASE REPORTS.

DOUGLAS MACFARLAN, M. D.,

Philadelphia, Pa.

THE SUBJECT of pyorrhea alveolaris cannot but be fresh to the mind of the nose and throat specialist since in the past few years it has received such an impetus in the insistence upon mouth infection, in the rediscovery of the mouth amebæ and from the much advocated recommendation for the use of emetin. As usual, enthusiasm has overstepped the bounds of reason or common sense. Every physician has sought for the "source of infection" in the mouth, and many have been pleased to have something so subtle as a "concealed focus of infection in the mouth" to use as a makeshift for a doubtful diagnosis. The layman, too, has read of or heard of the subject, and at times may force us into a consideration of his own case in this "new light."

Though there is very little new in the world, a retrospection of the results of all this recent work, clearing up now from the extremes of enthusiasm, shows certain new facts established.

(1) *There is* such a thing as "mouth infection" (which does not necessarily have to be a pyorrhea), and there are cases of undoubted constitutional trouble due solely to this localized infection, its toxic products or an extension from the local infection.

(2) *There are* amebæ in the mouth, probably of a single genus these are often found in pus pockets anywhere in this tract, in the tonsils, in the gums, in jaw abscesses, and in the nasal sinuses. These ameba are probably pathologic, for, on getting rid of them, the local trouble they produce (?) improve.

(3) Emetin is a useful specific in killing the ameba.

(4) Emetin often fails to clear up completely a given case of pyorrhea.

(5) Emetin has little effect on the bacteria of the mouth.

(6) Dental conditions and the salivary factor¹ are undoubt-

edly important conditions that mean much in the continuance of the case.

Much has been said by the writers on this subject of pyorrhea and mouth infection about its effects on the system, but little has been said concerning the constitutional condition as a predisposing factor to disease of the mouth. When we recall how readily general nutrition plays a part in the condition of the mouth (as particularly seen in scurvy and the dyscrasias of children), we can see that this is a factor of no mean importance. Notice how often the breath is foul and offensive in ill health, how loaded the mouth must be with bacteria in many of these cases.

Another omission worthy of note, is that lack of consideration of the pathological picture presented by the case. In nearly every instance the picture varies and there can be essentially no one line of treatment to all. One case needs dental work, fillings put in, stumps removed, or tartar cleaned away; another is constitutionally out of trim, he is sedentary, constipated, anemic and hollow chested. In the latter case, it is a matter of driving in health to drive out disease.

The local picture of alveolar absorption, separation of the gums from the teeth, loose pockets about the gums and chronic low grade inflammation of the mucosa, tenderness and bleeding—all speak of a sluggish condition that can be treated locally upon but one line, as follows: The local condition of heavy bacterial infection (either causative or secondary) calls for mild antiseptics; while the slow indolent inflammation requires stimulation. If well controlled as to the degree of strength used, the stimulating antiseptics are the drugs of choice for local treatment. I have long been partial to a double iodide of mercury and potassium one-half to one per cent. solution, although I use formaldehyde and emetin for the same purpose. Emetin I consider the least satisfactory because of its low bactericidal effects and greater irritation to the mucosa, though it may be specific for ameba; the following cases will show instances where it fell short of clearing up the bacterial element:

E. S., a middle aged woman, had been suffering for two years from neuritic and neuralgic pains in various parts of the body. Her physicians had treated her for these troubles by various methods and with various remedies. When I saw her, she had a mild pyorrhea, showing only the symptoms of soreness and bleeding of the gums, no

A CONSIDERATION OF PYORRHEA.

recession nor looseness of the teeth; there was a thin white line of pus about the gum margins and little separation between gums and teeth. The teeth were in good condition, no cavities and no tartar. She had mentioned this pyorrhea herself, and said that her last physician had discovered it and had treated her with about eight doses of emetin hypodermically and emetin locally upon a swab. She had noticed no improvement. I used twice daily a solution of double iodide of mercury one-half per cent. as a swab and found that it cleared up the condition completely². The neuralgic symptoms were independent of the pyorrhea.

E. B. P., a young man in good health except for a severe pyorrhea and stomach symptoms of loss of appetite and dyspepsia. The teeth were in fair shape except for the deposit of tartar; there was recession of the gums and deep pus pockets extending down toward the teeth roots. The mouth was quite "foul." In the interdental spaces the gums had hypertrophied into what looked like "proud flesh," the teeth were loose, the gums were quite sensitive and bled readily. Emetin was used for three weeks by local injections into the pus pockets and by swabs laid between the lips and alveolar margin. The tartar was removed. With the emetin improvement was noticed to a certain degree; then it came to a standstill. The mercury solution was then used and cleared up the case in three days' time; that is, the pus disappeared in this time and the sensitiveness, bleeding, recession of the gums and the looseness of the teeth progressively improved. So remarkable was this result that not more than two months later this patient, when he went to the dentist to have a broken tooth fixed, was told that he had never had pyorrhea. The dentist told him that nothing could make him believe it. In this case I chipped off and scraped away the tartar myself, though I prefer for thoroughness sake to have the dentist do it; there seemed to be very little tartar deposit down in the crypts; in fact, I would say there was none, but there was a roughness from the dental erosion about the tooth root. The absorption of the alveolar socket was very noticeable and left so much room that I could readily get deep down along the root. The interdental alveolar processes were also noticeably absorbed. When the condition improved and the teeth became firmer, I imagine this space filled up with firm soft tissue and not bone, for the improvement was so rapid that bone could scarcely

have had time to form.³ This case has remained well for a year with no suggestion of recurrence. The stomach trouble has cleared up.

— —, a poor and slovenly Jew, age about sixty-five, had the worst case of pyorrhea I have yet seen. From the fetid condition of his teeth and gums, it is a wonder he did not get ulcerative stomatitis. He, too, had severe stomach trouble, evidently from swallowing this fetid detritus. The teeth could be actually picked out with the fingers, and some of the decayed stumps were removed promptly to try to improve what appeared to be a hopeless condition. Emetin was used locally as a spray in a De Vilbiss atomizer with an adjustable tip. With this atomizer the patient could himself force the solution fairly well down into the crypts. He improved under emetin, but only slightly, and the use of the solution annoyed him by the mild pharyngitis it set up. The mercury solution was resorted to and from the first gave help. There happened in this case to be no tartar deposits and the teeth seemed to get firm in their sockets rather quickly. The pus decidedly decreased and with it the bleeding and sensitiveness. He was sent to have his dental work done and continued with the use of the mercury solution. Two months later, that is, two months after the beginning of any treatment, he still had a little pus that could be pressed out of a few of the old pockets. But, generally speaking, the mouth had an entirely different appearance; there was practically no pus, no bleeding, no looseness and no sensitiveness. The gums still were somewhat receded, especially in the interdental spaces where I had cut away the thick pieces of proud flesh. The stomach condition is decidedly better, though his digestion is undoubtedly permanently impaired.

J. E. N., a somewhat overworked business man, age 40, came to me for some incidental complaint, and I found on going over him that he had a moderate pyorrhea. Without going further into the simple details of the case, I cleaned up the tartar on his teeth and injected emetin into the pus pockets; improvement was noticeable but not complete until I abandoned the emetin and used the mercury solution. The latter I administered locally in the form of a spray.

I have had a number of this type and have noticed a very analogous condition in the treatment of atrophic rhinitis. For some time it has appeared to me that there was much in common between the two diseases, as far at least as the pathological manifestations go; both have bone absorption, a marked purulent element, and a sluggish mucous

A CONSIDERATION OF PYORRHEA.

membrane. Some years ago I started using the mercury solution in the atrophic nose and in atrophic sinuses, and preferred it to formaldehyde and scarlet red which were analogous in the rationale for their use—stimulating antiseptics. When emetin came into vogue I began using it, and recall a number of cases which gave a typical history of improvement up to a certain point. Dr. Ivy is the first, I believe, to report a sinus case treated with emetin. His case was one of a sinus from a purulent right antrum; he instilled emetin in the antrum through the sinus, which had opened under the right eye. The case cleared up. About a month later I tried the same treatment on a case of Dr. Scarlett in Trenton. The patient, a young girl, had an infected antrum or rather a purulent antrum, the consequence of a long standing atrophic rhinitis. A great quantity of pus was washed from the sinus and emetin solution, $\frac{1}{2}$ per cent., instilled through the canula. Only once was emetin instilled, for the pus cleared up, not to return for months later, when the mercury solution was used. In a year's time the pus has not returned and the atrophic rhinitis is entirely relieved by the mercury spray. I have had any number of atrophies in all stages relieved by the stimulant-antiseptics.

In conclusion, I would suggest that pyorrhea, atrophic rhinitis—or any other complaint—when one is treating it locally, should be treated along the lines of what its pathology demands. We have a condition that falls short in certain normal functions, we have remedies that produce certain effects. Pyorrhea has an element of pus associated with it, and the mucous membrane is chronically inflamed and "sluggish." The low grade persistent irritation has made the mucosa unresponsive; to personify it, there seems no desire to throw the condition off. The stimulant-antiseptics cover these two elements of the disease and, as a consequence, give the results.

¹J. OF OPHTHAL., OT. AND LARYN., Aug., 1916, pp. 699-700.

²Notes on the Study of Potassium-Mercuric Iodid., D. Macfarlan, *Jour. Med. Assn.*, LXII., p. 17-19, Jan. 8, 1914.

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3. M. H. Cryer, *Dental Cosmos*, Aug., 1916.
1805 Chestnut St.

GLAUCOMA CONGENITALIS AND BUPHTHALMIA WITH A SOFT EYE IN THE SAME PATIENT.

DEWAYNE HALLETT, M. D., AND M. B. BEALS, M. D.

New York.

IN VIEW of the comparatively small number of recorded cases of congenital glaucoma, the following case of double buphthalmos seems worthy of report, particularly as one eye had passed to an atrophy of the secreting function, or possibly a detachment of its retina, and, while the globe and cornea were of enormous size, the tension as registered by the Schiotz tonometer was equal to only 3 mm. of mercury.

The other eye, the left one, was much smaller, but still markedly buphthalmic and actively glaucomatous.

The patient, G. C., aged 7, son of Italian parents, was brought to the New York Ophthalmic Hospital, March 4, 1916, and from the mother a history was secured to the effect that at birth the right eye was very large, even larger, she asserted, than at the time of making these notes; that at one time the lids could not cover it, and that it seemed never to have had any perception of light. She had apparently not observed the left eye to be faulty till after the boy had entered school in October, 1915, at which time the child had sufficient vision in it to learn to read.

The general history was that the boy was breast fed and learned to walk at sixteen months. There were two other healthy children, and one had died from an undiscoverable disease. The child's father had poor health, and he, his parents and two sisters and one nephew were considered to be mentally unbalanced ("crazy"), and another nephew partially so. Early in 1916 the mother and the teacher noted that the child's vision was failing, and finally he could no longer read.

Upon entering the hospital a test of vision showed the right eye blind and with the left one he could count fingers at three feet.

The right eye was very soft, tension 3 mm. Hg., the globe very large, cornea very large, very deep anterior chamber, pupil small, fixed and filled with a gray exudate, but free from signs of inflammation.

The left eye presented all the signs of buphthalmia (hydrophthalia) but was smaller than its fellow. It was nystagmic and the optic disc was deeply cupped. Tension 58 mm. Hg.

Neither eye had any irregular corneal or scleral ectasia. Diameter of right cornea 18 mm., left 14 mm. Treatment was confined to the left eye. The effect of miotics reduced the tension to 50 mm. Hg.

On March 17, 1916, we made a scleral-corneal trephine operation with a wide iridectomy, using a 1½ mm. instrument.

Tension, at first low, gradually rose to 36.

May 2, 1916, we made a similar operation with iridotomy.

Tension gradually rose to 30, under a miotic.

June 13, 1916, made a third trephine operation with a 2 mm. instrument. The 2d and 3d operations were followed by an obvious filtration bleb.

July 10th, tension 22 mm. Hg., and he was discharged from the hospital with a vision of 20/100.

September 12th, this patient was present in the clinic and the tension of the left eye was 16 mm. Hg. The media is clear. The optic disc sharply cupped with cut-under edges and disappearing blood vessels. The retina is of good color. There is an obvious filtration bleb.

The present vision is limited to the ability to count fingers at 20 feet distance, to spell out the letters in number 11 Jaeger's type, and telling the time on a watch. Retinoscopy shows this eye to have 3 diopters of myopic astigmatism, but it cannot be demonstrated that vision is improved by this correction.

Speculation as to the processes which were probably responsible for the extreme softness of the very large right eye must be based largely upon theories.

Axenfeld¹ reported a case in which a detachment was discovered by the ophthalmoscope before phthisis developed, and Arnold Knapp² reports a similar case.

Neither of these eyes were operated, and each gradually became small, soft and blind.

It is known that old glaucomatous eyes frequently show a fluid vitreous. Perhaps we may assume that long continued high tension cuts off the nutrition of the vitreous causing it to shrink, while at the same time it produces an atrophy of the secreting portion of the uvea.

If then in these cases there is a congenital lack of filtration spaces and of Schlemm's canal, any operation that will save the vision must be undertaken before such secreting portion of the uvea and the vitreous atrophy.

¹Axenfeld: Ueber das Vorkommen von Netzhautablösung beim Hydrophthalmos, *Klin. Med. f. Augenh.* 1903 xli.

²Knapp: *Journal A. M. A.*, July 29, 1916.

274 West 86th Street.

A CASE OF ACUTE MASTOIDITIS FOLLOWING
MIDDLE EAR ABSCESS, COMPLICATED BY
ERYSIPELAS AND FOLLOWED BY A
FATAL SEPTIC MENINGITIS.

THEODORE ZBINDEN, M. D.,
Toledo, Ohio.

G. W., clerk, æt. 19, came to the office of Dr. I. O. Denman, May 31, 1916, complaining of severe pain in the left ear, of five or six days' duration. Family history and personal history were of no importance.

Patient was a tall, slim boy, of weak constitution. He looked profoundly septic, and was immediately advised to go to Toledo Hospital, go to bed, and have a hot flaxseed poultice applied. Temperature on admission was 102.8°, pulse 112, respiration 22. The urine was negative. The intention was to perform a paracentesis as soon as possible, but the membrane ruptured of its own accord late the same afternoon.

June 3rd the temperature had come down to 99.6°, but the pain had continued very severe, and the patient did not seem to be doing well. A microscopic examination of the pus from the ear showed a long chain streptococcus in large numbers. Urine contained a trace of albumin. Blood examination as follows: Hb., 100 per cent.; rbc., 5,800,000; wbc., 15,160: polymorphonuclears, 78.3 per cent.; lymphocytes, 16 per cent.; large mononuclears, 2 per cent.; eosinophiles, 3.3 per cent.; basophiles, 4 per cent. The same day a mastoidectomy was performed at 4:30 p. m. by Dr. Denman, under oxygen-nitrous oxide anesthesia, administered by Dr. E. I. McKesson.

Improvement was slight for a day or two, but became very marked after three hypodermic injections of streptococcus-sero-bacterine. By June 14th he was up and about in a wheel chair feeling very well.

The next day, however, severe pain in the ear returned, and a septic temperature appeared, which was not checked by aspirin. He gradually became worse until June 21st, when temperature was 104°, pulse 164, respiration 32. The white cell count was 20,200, 85 per

cent. polynuclears. Dr. F. W. Alter was then consulted, and it was decided to reopen the wound and curette, but the wound itself revealed no cause for the serious condition.

However, on the following day it became apparent that erysipelas had developed, which started from the wound and spread over the face, neck, shoulders and back. Also the discharge from the wound was found to contain a *staphylococcus-aureus* in addition to the streptococcus. The erysipelas took on a very severe form during the next five days. Treatment consisted of local applications of ichthyol and tincture of iodine, of the internal administration of digitalis, alcohol, of strychnine hypodermically, and about 200 c. c. Anti-streptococcic serum given for the most part intravenously.

By July 1st the erysipelas was well under control, although there was a mild recurrence on the face July 5th and 6th.

July 11th, temperature was normal, and patient felt perfectly comfortable sitting up in bed. He had an excellent appetite, but complained of difficulty in swallowing. Two days later temperature rose suddenly to 104° , and a splitting pain in the top of the head came on. An ice-cap was applied to the head. The following day the temperature rose to 106° in the axilla, with a pulse of 132 and of poor quality. He was given about 1,800 c. c. saline solution intravenously, with ten minims adrenalin. A spinal puncture was made and 50 c. c. of cloudy fluid under pressure was removed. The fluid contained an enormous number of pus cells, the infecting agent being the *staphylococcus-aureus* in pure culture. Strychnine was given hypodermically, and urotropin by mouth, 10 grains every three hours. Continuous enteroclysis, by the drop method, was employed, and the ice-cap put over the heart.

The following day another spinal puncture was made, removing 45 c. c. of cloudy fluid. At the same time there was introduced into the spinal canal 20 c. c. of serum with 1-50 grain bichloride of mercury. For two days patient was much better, but then the temperature rapidly rose to 106° , and coma developed. On the 18th another spinal puncture was performed, but only 25 c. c. of fluid was obtained. A lesser amount of serum with mercury was again introduced. However, no improvement followed the last puncture, and the patient died on the 20th at 3:10 p. m.

A CASE OF ACUTE MASTOIDITIS.

AUTOPSY.

Autopsy was performed on the evening of the 20th. The skull was opened and there was found a meningitis involving all three membranes and located in the frontal region, extending from the superior longitudinal sinus five or six cm. to the right, and but slightly to the left. Otherwise the brain was entirely normal. The membranes in the neighborhood of the left mastoid and petrous bone were not inflamed, and all the sinuses showed not the slightest involvement. However, when the cord was severed, a large amount of yellow pus flowed out from the spinal canal, and there was a marked inflammatory process involving the membranes about the cord.

The remaining organs showed no change whatever. The spleen was not enlarged, and no foci of infection were found either in the spleen, liver or kidneys. The heart was not examined, but had never given any clinical evidence of disease.

CONCLUSIONS.

Several important lessons are to be drawn from this interesting case.

First: The danger of delay in a case of middle ear abscess. This boy had a mastoid involvement while he was in the care of a physician who failed to have an early paracentesis performed. It is true the membrane ruptured of its own accord, but not until a severe mastoiditis had already developed.

Second: The value of the sero-bacterins. One would like to believe that the rapid recovery after the first operation was greatly helped by the use of the three injections of sero-bacterin. But if they did produce an active immunity, it was certainly short-lived, because the erysipelas which developed ten days later was, of course, simply another form of streptococcus infection, and it was a very severe one.

Third: The meningitis was evidently not caused by direct extension of the mastoid infection, because the membranes of the brain and bony surfaces in the neighborhood showed no involvement whatever. It is more likely that the infection was carried by the blood or lymph to the meninges, and caused the final fatal disease.

412 Colton Bldg.

CONGENITAL MALFORMATION OF THE ETHMOID BONE.

EVAN S. CONNELL, M. D.,

Kansas City, Mo.

H. E. S., male, aged 22, was referred to me April 9, 1915, for nasal obstruction. He had been unable to breathe freely through the nose since childhood. The difficulty was more marked at times, especially at night, and he suffered much from insomnia.

The septum was deflected to the left to such an extent that a view of this cavity was impossible. The right nasal cavity was obstructed by hypertrophied turbinals. The patient also had a narrow, V-shaped palate, protruding incisors and a bifid uvula.

April 20th I undertook a submucous resection. After working around the acute angle at the anterior part of the septum, I found that the elevators encountered a firm resistance. I removed this angle of cartilage, and to my surprise found the left fossa above the level of the inferior turbinal completely occluded by a large, firm mass, and that the mucous membrane of the septum turned at right angle and became continuous with the membrane over its anterior surface. No middle turbinal was present. There was a passage beneath the mass to naso-pharynx, but this was small due to the deflected vomer.

Using a Jansen-Middleton forceps I bit into the inferior septal angle of the mass and found it composed of spongy bone. I then removed the deflected portion of the vomer and enough of the mass to establish a free passage to the naso-pharynx. The nose was packed and cared for in usual way. Healing was prolonged, but uneventful.

Now let us consider the anatomical findings, first remembering that the boundaries of the nasal cavity at the position of the mass are as follows:

Roof: Cribriform plate of the ethmoid.

Floor: Palatal process of maxilla.

Median Wall: Perpendicular plate of ethmoid; Vomer.

CONGENITAL MALFORMATION OF THE ETHMOID BONE.

Lateral Wall: Lateral mass of ethmoid; turbinated bone; inner surface of body of maxilla.

In this case instead of a differentiated lateral mass, cribriform plate and perpendicular plate there was a single mass of spongy bone.

Taking into consideration the history, deformed palate, bifid uvula and operative findings, I feel justified in classifying the case as one of congenital malformation of the ethmoid bone.

TEMPORARY LOSS OF VISION DUE TO A DISEASED TOOTH.

CHAS. C. BOYLE, M. D.,
New York City.

ON MARCH 21, 1916, a young lady came to see me for sudden failure of vision in left eye. On testing, R. V. = 15/15; L. V. = 15/40. No change in fundus shown by the ophthalmoscope. Rather doubted it had come on suddenly; thought it was either congenital or possibly hysterical, although no symptoms of hysteria. Gave Strych. Phos. 2x q. i. d. and applied galvanic current.

March 25th, vision the same. Asked if she had any bad teeth. She said she had an old root on that side. I told her to have it taken out, which she did that day.

March 28th, R. V. = 15/15; L. V. = 15/20. Said that dentist told her there was an abscess at root of the tooth that was extracted.

April 1st, R. V. = 15/15; L. V. = 15/15.

She stopped treatment after this, and as she has not returned, I conclude that her vision has remained normal. Evidently the tooth was the cause of the loss of vision; but why?

40 East 41st St.

ABSTRACTS:

Treatment of Ozena and Asthma With Autogenous Vaccine.—Dr. Charles L. Klenk, of St. Louis (J. OF O. AND O.-L., July, q. v.), makes a most encouraging report. He is convinced that the organism discovered by Perez is the true cause of ozena, and agrees with the original investigation as to the simplicity of these agglutination tests, especially when a pure culture was attainable. He was not able to get an agglutinative serum in any case which gave a positive Wassermann.

His vaccines are usually made from the semiliquid portions of the greenish stinking crusts. If a pure culture is obtained, after at least 10 or 12 transferels on albuminized agar, a rabbit is inoculated with its saline suspension; if the patient's serum from which the organism has been isolated agglutinates the rabbit bacteria (in a dilution of at least 1 to 30), the findings are positive and the organism is used in preparation of the vaccine, which, after proper controls to ensure sterility, is transferred to ampoules of single dose of 1, 2, 4, 6, 10, 12 and 15 drops each.

The bacteria are not washed, for the coccobacillus produces an extracellular toxin, which seems to be necessary for the best results.

If there is too severe general reaction, such as headache, vomiting, backache, perhaps collapse, severe chills and a very high temperature, the dose is too large, and after such reaction has disappeared, one-half of the next tube should be given. From 7 to even 21 doses are given at intervals of maybe a week or more. The usual reaction (sometimes wanting from the first dose) in 12 to 24 hours is local pain, tenderness and redness, accompanied after the third or fourth dose with some rise of temperature and nasal discharge (to acute rhinitis); after tube 4 no fever and less discharge; tube 5, crusts loosen; 6, no discharge and odor less marked; after tubes 10, 11, 12, etc., in most cases the odor has completely disappeared and many patients believe themselves well. The injection, under the skin, runs from 50,000,000 to 600,000,000 bacilli. Many of the patients appear cured, with exception of the atrophy. Some who are not doing well did not give positive agglutination tests, and in others the coccobacillus could not be isolated.

ABSTRACTS.

For *asthma*, the autogenous vaccine is still in the experimental stage, but the results, in 12 or 15 cases, are "very gratifying."

No animals are required in the preparation of this vaccine; all the pathogenic bacteria of the submitted material are used.

"Mrs. E. P., aged 59, janitress. Very often, during fifty years, severe cracking in back of head followed by excruciating headache. All previous treatments gave only temporary relief. Has always fondled dogs and cats. The fetor contaminated the room. Nose extremely roomy and covered with a large thick, hard, greenish black crust, which was removed with difficulty and extended through the pharynx, larynx and trachea. General health fair. Wassermann negative. *Coccobacillus fetidus* ozenæ (Perez) found and vaccine made. Local treatments discontinued.

Oct. 16, 1914, 50,000,000 bacilli injected subcutaneously.

Oct. 22, 1914, 100,000,000; 26th, 150,000,000.

Nov. 2, 1914, fetor almost gone. Patient can perceive odors again; still a few scattered crusts, easily removable, and the membrane looks reddened and moist. Very little local or general reaction resulted. Injected 300,000,000 bacilli. Nov. 16th, large crust in left nose, fetor bad, slight reaction. Weekly injections were continued; severe general reaction with chills and fever followed twice. Nov. 19, 1914, a trace of fetor present, large crusts again appearing. Injection caused only a slight local and general reaction. Six hundred million bacilli injected. July 24, 1915, the last injection was given. Crusts, fetor and pain have disappeared and patient has discontinued washing her nose for the past month; she reported feeling fine."—J. L. M.

Scintillating Scotoma.—George W. Swift, *J. of O. and O.-L.*, May, 1916, believes that (1) scintillating scotoma is far more frequent than is commonly supposed; it is often overlooked, because we pay little attention to the scotomas and attribute the headaches to other causes; (2) that the average ophthalmologist does not attach sufficient importance to this condition, chiefly because its sequence of symptoms is not clearly unraveled, and (3) the haze that surrounds the etiology has, in a measure, prevented us from calling it to the attention of the neurologist and internists.

Scintillating scotoma may be described as a symptom-complex,

ABSTRACTS.

characterized by peculiar disturbances of sensation in the arm and face, a terrific headache, and, finally, drowsiness and sleep.

Synonyms: amaurosis partialis fugax, transient hemianopsia, flickering scotoma, migraine oculare.

The visual disturbances fall usually into three types: (1) Hemianopsia. In these cases the sudden appearance of a typical hemianopic field is the characteristic onset. One-half of the page suddenly appears perfectly white. This lasts for some months when a bright spot within this opaque area appears. This gradually enlarges until it covers the entire visual field and then disappears. The bright "fire-like" area may assume varied shapes, a crescent, ball or irregular zigzag appearance. (2) A gradually increasing evanescent central scotoma, suddenly appearing in the visual field. (3) The lighter types are characterized by the suddenness of appearance, shortness of duration (all being temporary), and finally by their ever changing shapes.

Numbness. Following the disappearance of this scotoma, there develops in some cases, though not in all, a tingling sensation in the hand which gradually progresses to the arm, shoulder, neck and one side of the face. This usually occurs on the opposite side to the scotoma, though not easily demonstrated from the patient's description. In severe cases speech often becomes affected. This phenomenon does not last very long, usually but a few moments.

Headache. Just as the patient recovers from his fright, and believes it is a simple matter a terrific and splitting headache follows, the patient becoming almost frantic in severe cases. The duration is usually from one to three hours and usually disappears after the patient sleeps, but this is not always the case. Just what factor sleep plays in the relief of the headache is still uncertain. The headache is caused probably by over-congestion of the brain.

Changes in the eyes. Dr. Swift has not noticed any changes in the eyes except dilatation of the pupils. This is probably due to fear. Refraction of the eyes is essential, in that many cases are relieved from frequent attacks after having their errors corrected. This is due to the fact that fatigue is essentially a cause.

Urinary disturbances have been noted in these cases: the characteristic retardation during the attack and then the passing of abnormal amounts of urine. Indican and urates have been noted.

Prognosis is good. It is never the beginning of serious intracranial condition, as practically all the patients fear.

Differential diagnosis. In true migraine the scotoma is absent and the onset is preceded by subjective phenomena; in epileptic attacks, consciousness is lost for a few seconds to minutes with the other characteristic differential signs, and hysteria and neurasthenia.

Etiology. "So far as I have been able to investigate I have not found any theory other than faulty innervation of the circulatory apparatus (Fuchs), but practically all authors speak of exhaustion as a possible etiologic factor." The most common type, perhaps, is the mixed mental and physical exhaustion.

The author does not believe this condition due to faulty innervation of the circulatory system. Why should a person have the attacks at such rare intervals as is common in many cases? Why should in each case one find the same typical sequence of symptoms? If due to a spasm, why should it not affect other vessels and cause other disorders? While we cannot disprove that theory, another explanation is more plausible.

According to Crile, the kinetic system includes the brain, muscles and the glands, adrenal, thyroid, pancreas and liver; the brain is the organ controlling all the actions of the others; it is the central battery; the adrenals govern immediate oxidation processes; the thyroid, conditions favoring tissue oxidation; the muscles, great converters of latent energy into motion and heat. From experiments in the laboratory, he and his associates have demonstrated that the excretion of epinephrine into the blood in greater than normal quantities is the direct result of certain stimuli acting through the brain center. Also, that the same causes that bring about hyperepinephrin secretion act at the same time upon the brain cells. In other words, the two result from one stimulation. Further, they have proven that exhaustion, whether physical or psychical, causes this over-action of the brain cells and adrenals.

This theory of the kinetic system has opened a vast field of possibilities, but nowhere can its clinical workings be more striking than in the subject under consideration.

Exhaustion is the chief contributing cause of an attack. Crile and his co-workers have proved in their laboratory experiments that exhaustion causes brain cell over-activity and hyperepinephrin secretion.

Bernard has shown that hyperepinephrin causes vertigo, tinnitus, visual disturbances, headache, later aphasia, transient hemiplegia, convulsive seizures, cerebral hemorrhages or sudden death. Vascular sclerosis and cardiac hypertrophy cause the changes.

The changes in the brain cells were found by Crile to be more in the occipital lobe than the base, to extend forward involving other areas. Here we find the clue to our visual disturbances followed by the motor disturbances and aphasia. Again, the epinephrin causes the headache by the over-stimulation of the heart's action, but its oxidation (within from half to a full hour) and the associated lowering of the pressure allow a recedence of the cerebral congestion; sleep follows, and upon awakening a more marked urination carries away the last clinical manifestation of the attack.

Swift's theory is this: that anyone is liable to an attack of scintillating scotoma whenever the kinetic system becomes overworked and the perfect harmony has become disturbed; that there are many cases of scintillating scotoma which are not of sufficient importance to the patient to warrant comment; and that we do not ferret out the facts when we hear of a terrific headache.—J. L. M.

Lung Abscess Following Tonsillectomy.—In the July *Laryngoscope* appears an article and a discussion of this occasional complication of tonsillectomy. Dr. Richardson has collected quite a number of cases that would almost startle the average practitioner and, further, he implies that there are many more cases that go unreported. "The causation of pulmonary abscess secondary to tonsillectomy is in all probability through embolism or infection of the lung. At the time of the operation a large number of veins are opened and these may remain patulous for several days. Septic clots or septic material may thus be carried into the lungs." Coakley, in discussion, doubts the possibility of embolism or infection. "If the condition simulated pneumonia with gangrene supervening, one might suspect multiple foci of infection with general consolidation like pneumonia, as probably due to infection getting into the venous circulation, through the plexus of veins around the capsule of the tonsil. I have never seen open veins after any tonsillectomy, as reported by Yankauer. I suspect they are open if there is any bleeding. After checking all the bleeding, I frequently see veins, some with circulating blood, others containing thrombi, but

none open." Coakley suspects some antecedent cause as responsible for possibly a few cases, but considers with Manges that aspiration of blood and tonsillar tissue are the most important causes. The lessons given by these cases are: (1) deep anesthesia beyond the point of the throat reflex, (2) stopping all bleeding from each tonsil as it is removed, and (3) keeping the oro-pharynx free from blood (the assistant's duty).—D. M.

A Tribute to the Profession.—The most exact, complete, satisfying and influential description of true neighborliness in all literature is the parable of the Good Samaritan:

Which of these three, thinkest thou, proved neighbor unto him that fell among the robbers? And he said, He that showed mercy on him. And Jesus said unto him, Go, and do thou likewise.

It is an important lesson to be drawn from the great war that under the passionate excitements and tremendous strains of the widespread disaster the medical profession and the nurses of all countries are holding firmly to that exact definition of the neighbor, and are obeying strictly the command, "Do thou likewise." These are men and women who have received thorough training of the senses without suffering any loss of quick sympathy or of human devotion.—Chas. W. Eliot.

The True vs. the Sham Editor.—No, I distinctly do not believe that an editor should give his readers what they want or what he thinks they want. I'd be d—d before I would be an editor on such conditions. I believe an editor should be a leader, and a leader should not give the people what they, in their stupidity and ignorance want, but what in the editor's opinion is good for them; *not what they want, but what they need*, should be an editor's motto. If the people don't like what the editor is giving them, they are not forced to read his paper or magazine; but it is his duty to be true to his ideals and principles. If he merely gives the people what they want, he is not a true editor, but a sham counterfeit. He is not an independent leader, but a mercenary follower—W. J. Robinson, *Critic and Guide*.

Nasal Obstruction: Rising to the Emergency.—Several days ago, a man in an excited condition hurried into my office and reported that his little son had a button stuck in one of his nostrils. Immediately I was

reminded of an experience I had about twenty years ago. At that time, I was in a drug store when I was called to see a child, about three years of age, troubled in the same way. Looking up the child's right nostril I discovered there a shoe-button firmly impacted, but could not remove it in the usual way. So, I told the father to hold the child in his arms while one of my friends held its head. Then I pinched the child so that it cried lustily, whereupon I applied my mouth to the child's mouth and vigorously blew into it, with the result that the button flew out from the nose.

Remembering this experience, I submitted this child to the same treatment and promptly secured the same result. This child had a similar experience about a year before, but, as I was not at home, the father went for a local colleague who specified in diseases of the eye, ear and nose. He failed to remove the button, whereupon the family took the child to their own physician in New York. That gentleman etherized the infant and pushed the button back into the pharynx.

There is a knack in "doing things" without instruments. I have exercised a similar knack in examining the vagina. I have used a large tablespoon, bending it so as to make it a very passable speculum.—A. J. Anderson, *Clinical Med.*, June, 1916.

In the *Medical Council* Lieutenant Warren gives an interesting account of the treatment meted out to a Redskin suffering from an angina. The account follows:

Ludwig's Angina.—Recently a Navajo Indian died from Ludwig's angina, which was possibly induced by a retropharyngeal abscess. He was sick altogether several weeks, and tried one medicine man after another until he had treatment from everyone in his part of the country except one. They had arranged to change medicine men again and have this last one if the patient did not get well in three days, and he was already on the ground watching the tricks of the medicine man who preceded him, but the patient died just before the three days were up, so there was nothing left for this last man to do except to dance, sing and groan at the patient's funeral and help to bury him.

Indian Surgery.—In this case of Ludwig's angina there was much brawny swelling of the trapezius and other muscles of the back of the shoulders, neck and head. Neither an abscess nor any considerable amount of pus was demonstrable, although a post-pharyngeal

abscess, as before mentioned, may have existed. The patient either could not or would not open his mouth sufficiently to permit an examination of the posterior pharyngeal wall. At one time when the missionaries visited this man they found an Indian dancing around behind the sick man and jabbing at his swollen neck with a sharpened stick which he had in his hands. He was making an effort to puncture the swelling as the sick man had requested him to do. Two other Indians were sharpening some rusty old knives preparatory to trying to open the swelled neck. They told the missionaries that the sick man had been trying since morning to get them to cut his neck and let out something which he thought was in there.

Pieces of sharp glass, sharp-pointed pieces of tin and sharp knives are used by the Kiowa Indians in Oklahoma for doing what they call "cutting," but as a rule they do little more than scratch and dig up the surface of the skin a little and cause slight bleeding. The medicine men, though, sometimes precede or follow this scratching process with cupping by means of a horn. They also apply their mouths directly to the unbroken skin of a diseased part of the body and go through a sucking process until blood is brought either from the patient's body or, probably more often, from an easily bleeding point in their own mouths.

Delayed Secondary Hemorrhage Following Tonsillectomy in a child aged 14. Enucleation was absolutely clean, no tissue remnants in the fossæ. At time of operation a large bleeding vein in the superior angle of the right fossa was seized with a hemostat which was removed after several minutes. Convalescence good until the fifth afternoon, when the mother telephoned the child was spitting blood.

A large clot was found in the right fossa streaked with a small quantity of bright red blood. There seemed to be very little coming at this time. The clot was left in the fossa; ice bag to the neck and ice in the mouth was advised. 11 p. m. reported to be spitting blood in larger quantity, but when seen the patient was found to be in practically the same condition as in the afternoon. A hypodermic of morphine was given, and there was no more bleeding.

Dr. McKinney, who reported the case to the Memphis Soc. of O. and O.-L., attributed this bleeding to a slough at the end of a vein from the hemostat.

If so, commented Dr. Stanford, we should have many more such cases.—J. L. M.

Deafness From Gas Poisoning.—A man, aged 21, had been overcome by "gas" and was unconscious three days. On regaining consciousness, his hearing was very bad, somewhat improved before presenting himself at the office. Then hearing was for both ears: conversation, 10 feet; whisper, 1 foot; Rinne, +; Schwabach shortened; C¹ + and C +; tinnitus. The vestibular tests were normal. Drums normal and Eustachian tubes patent. R. Strychnine nitrate internally and sweats.

Within three months the hearing was almost normal, whisper 18 feet, both ears.—*J. O. and O.-L.*, July.—J. L. M.

Additional Fixation of the Eye in the Standard Cataract Extractions.—D. W. Stevenson (*Ophthalmic Record*, June) advises that the eye speculum be discarded during the whole operation, because many of the world's best oculists have had catastrophes immediately following the incision, due to spasm of the orbicularis; and because many aged patients have arterio-sclerosis, diabetes, nephritis or choroiditis and retinitis. But the support of the lids helps to steady the eye from rotation or displacement.

Hence Dr. Stevenson has his assistant, before the primary incision, seize the eye with a fixation forceps just below the cornea and very slightly to the temporal side, and pull the eye forward in line with the optic nerve. This traction elevates the eye, so that there is greater space for movement of the Graefe knife and—what is more important—it deepens the anterior chamber, so that there is no danger of the iris floating before the knife. The surgeon applies a second fixation forceps 90 degrees nasally from the other: these do not require teeth (Allports with smooth serrations will do), or he might steady the eye with a cottoned stick applicator.

All through the operation Fisher's upper lid retractor may be used with his lower lid hook. The nurse's hand on the vertex will be out of the way. It is only when the lens is being expressed that the handles of the retractors are elevated so as to draw the lids upward and out of the orbit. At the end of the operation the retractors can be easily removed, especially with a Smith hook at the side; one is

removed at a time (after irrigation and anointment) and the lids kept close together.—J. L. M.

Method of Opening Drum Membrane. Guttman, *Laryngoscope*, XXVI., No. 7. A large series of cases are carefully reported by Guttman in his advocacy of the oval trephining of the tympanum for the purpose of draining acute and chronic, purulent and catarrhal otitis media. The opening remains patent, which is more than can be said of many of our linear incisions. His instrument for trephining is by this time familiar to all. As an anesthesia he injects 4 per cent. cocaine hypodermically in the upper wall, at the junction of the membranous and long parts of the canal. With children he prefers general anesthesia. The results reported are very convincing.—D. M.

Outgrowing Squint.—Why is it that so many family doctors tell mothers and grandmothers that the kiddies will outgrow their squint? Naturally, most of the mothers and grandmothers believe it. Yet very few, if any, children do outgrow squint. And the longer it is let go, the less the chances of a cure. I know that every once in a while some optometrist will break into print with the history of a case where he cured squint with glasses. But I never heard of one telling where he didn't succeed, and, believe me, there are lots of such cases.

When a squint has existed for years it usually takes a long time before it can be relieved, if it ever can at all, and when it comes to the squinter patiently going through ocular exercises for years, or for months, to get good vision back in that bad eye, most of them give it up and either make the best of the squint or let an oculist do some cutting.

The old family doctors should learn that there isn't one chance in a million of a child outgrowing squint with increasing age. Probably he would recommend the oculist, for professional blood is thicker than water, but the optometrist can fight for himself. He can advertise that some squints can be corrected by glasses; that it won't do any harm to try, but the younger the squinter comes the greater the chance of success. I would not blame a refractionist for cautioning the public against the statement of family doctors that young children will outgrow squint. The public should be told that the doctors who say this are wrong.—Minturn, in the *Optical Journal and Review*.

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Editorial

THE ROTATION OF THE EYEBALL.

THE present issue of the JOURNAL contains three papers dealing with the question of the location of the centre of rotation of the eyeball. This question was raised in the O., O. and L. Society meeting in June, 1914, by Dr. Edgar J. George, of Chicago, when he presented a paper under the title, "A New Conception of the Ocular Movements With a New Strabismus Operation Based Thereon." The paper was published in the JOURNAL, 1914, pages 442-450. Dr. George's contention was expressed as follows:

"In reality Tenon's capsule serves as a sling in which the eyeball rests, a hammock, as it were, and instead of the eye rotating at its equator in the capsule, it oscillates, swings or rocks at its posterior segment in all the degrees of the arc
* * * the center of movement being the macular region."

The paper naturally evoked a lively discussion. Dr. George A. Suffa, of Boston, who had devoted many years to the study of ocular movements, took an active part in the discussion, contesting every argument presented by Dr. George and ably defending the older and accepted views.

The question rested until the following meeting, June, 1916, when Dr. George again raised it through the presentation of a paper, entitled "Demonstration of My New Conception of the Ocular Movements." At this time he exhibited many interesting dissections and models to prove his claims, all of which showed his originality of thought and his earnestness of purpose. This second presentation of the case from Dr. George's viewpoint was again met with so pronounced a disputation that the President, Dr. William H. Phillips, of Cleveland, decided to appoint a Committee to investigate Dr. George's

theory, believing that a more satisfactory solution might be obtained thereby than through long drawnout discussions on the floor of the meeting. Accordingly, he selected three very capable and experienced members,—Drs. W. O. Bell, Dean W. Myers and J. A. Ferree. In the meantime the editor was instructed by Dr. Phillips to withhold the publication of Dr. George's second paper until the Committee was prepared to make its report, when Dr. George's paper should appear along with the report.

The report of the Committee's findings is contained in two papers—one by Dr. J. A. Ferree, assisted by Charles Sheard, Ph. D., entitled "On Ocular Movements and the Center of Ocular Rotation;" the other, by Dr. Dean W. Myers, entitled "Some Practical Experiments to Determine the Center of Rotation of the Eyeball," is a demonstration of the Eye Movements by X-ray pictures of an eyeball transfixed with a needle before enucleation.

Everyone receiving a copy of the December issue should read Dr. George's paper, as well as the Report of the Committee.

THE PATIENT AND THE OPERATION.

Justly or unjustly, the specialist in eye, ear, nose and throat work has gotten a reputation among the laity of being very handy with his knife; or, to put it more truly, he has been credited with an eagerness to operate. This reputation, while valuable a generation ago when the enthusiasm for surgery was at its height, is of doubtful value now. The patients no longer expect and want an operation unless it is absolutely necessary; they no longer are anxious to boast of the fact that they have had an operation,—where once they came with the expectation of an operation, they now often hesitate to come for fear of an operation—and when they do come they want to take full advantage of all other forms of treatment first. These facts must be taken into consideration by the physician even in the face of an obviously necessary operation. And it is well to anticipate this cautiousness of the patient by a direct statement before examination is made. A frank remark that you do not want to operate unless it is necessary and want to give the patient every advantage of other means of cure will often open up a channel of confidence between you and the patient that is invaluable to the interests of both. It may be argued that the patient is

left to decide. All well and good; for who has a better right to decide provided the situation is put up to him in all its light. The physician does not need to compromise his opinion or weaken the force of his advice if, after making an examination, he tells the patient that there is a possibility of relief of a given supposedly surgical case by other forms of treatment. He can give the patient an idea of the relative value of this possibility as compared with surgical measures, and leave the decision to the patient. It is surprising how often this attitude works out favorably; a few necessary surgical cases may be missed but the responsibility is not the physician's: more cases are obtained and with a firm strength of confidence that will bind the patient and doctor together for future relations. The physician will by this attitude work away from this obnoxious reputation for the ready use of the knife.

D. M.

THE ALCOHOL QUESTION.

At the recent National Election several States went dry, bringing the total number up to twenty-four. This result naturally started people to guessing as to how long it would be before the whole country would go dry; no one who reads and thinks can for a moment doubt that eventually such a thing is going to happen.

As physicians, how much have we contributed to the victory, so far won for the cause of prohibition? The answer is—very little as compared with what the laity has done.

If alcohol is injurious to the health of the one who drinks it, even in small quantities, and the fact is better known to us than to others, why have we not done more to educate the people and urge the enactment of laws to abolish it, rather than allow ourselves to be placed in the position of accepting the verdict from the people at large. This indictment might be met by the claim of a few that as physicians we have no right to meddle in politics, and that we are trespassing upon the rights of the individual, and other out-worn arguments. In reply it may be recalled that when it was first learned that infant mortality was proportionate to the number of bacteria contained in a cubic centimeter of cow's milk, we were the leaders in the movements to educate the people and force the enactment of stricter laws governing the care of milk from the cow to the suckling infant. At that time most of

us went so far as to subscribe money and time to go lobbying the Legislatures in the different States, and we succeeded in our efforts and the general public has reaped the benefit. If we had the courage of our conviction then, why not now?

Is there any reputable Internist or Specialist who is willing to present an argument to show that the drinking of alcohol improves the health of the eye, ear, nose and throat, or, in fact, any other part of the body? If so, the pages of the JOURNAL are at his disposal. We are open to conviction. Until then the indictment against alcohol will remain, "That alcohol, even in small quantities, is injurious to the health of the one who drinks it." And if this is true, then we, as physicians, are derelict in our duty to humanity, so long as we do not confess it and actually work to legislate against it, as we have in the past against impure milk, impure drinking water, crowded tenement houses, poor sanitation, and the evils of the various drug habits.

G. W. M.

AN UNNAMED SYMPTOM SYNDROME.

We by nature have the habit of looking at our cases as distinct entities or pictures, using disease classification merely for the sake of convenience. However, when a given picture presents itself repeatedly, we have reason to recognize it as an acquaintance and seek a label for it.

In Cabot's case history book I first read the description of a case of the type I am about to amplify, but I have never seen it mentioned elsewhere. The picture is one of a mild hyperemia, acute, of the fauces and pharynx, usually coming on over night and inexplicable as to the cause of onset. Late in the first day or the morning of the second day there is severe occipital headache, occasionally severe backache, which may persist for a day or two. There is practically no febrile reaction. The hyperemia and soreness of the throat may have entirely disappeared by this time. Concomitant with this rapid onset is the distinctive feature of swelling of the "leaders" of the neck, the sterno-cleidos and the posterior cervical group of muscles. This is an actual swelling and with it there is a stiffness of the neck; both symptoms being subjectively felt and objectively observed. Along the course of these muscles careful palpation will elicit nodosities, which are apparently ill defined and seem to be localized swelling of the

muscle greater at this given spot. This swelling is not glandular. The stiffness of the neck is not severe and there is no torticollis,—the condition is distinctly bilateral, though one side may be more affected than the other. Rarely are there any other complications, but occasionally one symptom may predominate and persist. There has been seen mild involvement of different serous surfaces, such as joints or the pleura but these have been of little consequence.

The cases run usually a short, uninterrupted benign course, terminating before a week is up. I would be interested to hear of the experience of others with this not infrequent symptom complex.

D. M.

WALTER WILLIAM IRVING.

WALTER WILLIAM IRVING, 1868-1916. Dr. Irving was born near Mukwonago, Wisconsin, January 22, 1868. He received his preliminary education in the public schools and at Carroll College, Waukesha. After several years of successful work in commercial life he entered Hahnemann Medical College in Chicago, and was graduated in 1897. After special training in the New York Eye and Ear Infirmary he was associated with Dr. E. W. Beebe, of Milwaukee, Wisconsin, and later in independent special practice in that city. Failing health in 1905 compelled him to return to open air occupation. After recuperation in California climate he resumed practice in 1915, when he became associated with Dr. J. J. Kyle, of Los Angeles, California. In August, 1916, he suffered from an infection of the hand, consequent upon an operation, and died October 13, 1916.

Dr. Irving was an active member of the Wisconsin Homœopathic Medical Society, serving several years as secretary; a member of the American Institute of Homœopathy from 1897 to 1910; also a member of the O., O and L. Society, and an active member of the Phi Alpha Gamma fraternity; also a loyal member of the Masons.

Dr. Irving was married to Emily Ward Pray, at Wyandotte Michigan, in 1901, who survives him.

DEMONSTRATION OF MY NEW CONCEPTION OF THE OCULAR MOVEMENTS.*

EDGAR J. GEORGE, M. D.,

Chicago, Ill.

AT our meeting last year the discussionists of my paper, "A New Conception of the Ocular Movements With a New Strabismus Operation Based Thereon," took exceptions to my theory of ocular movements, namely, that the movements of the eye were oscillation and not equatorial rotation, and claimed that my statements were startling, revolutionary and iconoclastic. Such had previously been anticipated and expected, especially when one makes such a radical departure from an old and established theory as the ocular movements, one would naturally become a breaker of images, in fact, an idol that had long been worshipped without a question of doubt.

Elbert Hubbard said: "Every good thing has been condemned in its day and generation. Every innovation has its fight for life. Errors when once set in motion continue indefinitely, unless blocked by a stronger force: and old methods of thinking and doing will always remain unless some one invents a new way, and then lives and dies for it. And the reason men oppose progress is not that they hate progress, but that they love inertia."

The extra-ocular muscles and ocular movements have not been a recent study with me. Their study has covered a period of years. In the beginning I could not convince myself that the theory of rotation was the correct one and represented the true movements of the eye, as their movements from that source seemed too complicated and unexplainable. Douders and Helmholtz made their theoretical geometrical calculations from Listing's law, established about 1857, without demonstrable proof.

I *dispute* the theory that the eye rotates at its equator, that it does not rotate in Tenon's capsule like a ball and socket joint, but instead Tenon's capsule serves as a sling, a hammock or foundation on which the eyeball rests and offers contra resistance to the traction of the recti

*Read at the Amer. Hom. O., O. and L. Soc. meeting in Chicago, June, 1915.

muscles. Stevens' Motor Apparatus of the Eye, page 68, says: "The glistening surface of the inner surface of Tenon's capsule in which the eye rests strongly suggests the rotation of the eye upon this smooth surface, as the head of the femur rotates in its socket. And this is the interpretation almost universally given by authors. The fact, however, of the close adhesion of the capsule around the scleral entrance of the optic nerve and that of its firm insertion around the eye near the cornea appear to render such movement of a very limited character. Experiments of Motais would indicate that the eye with its immediate investing capsule rotates in the bed of fat.' Oscillatory movement never seems to have occurred to either Motais or Stevens as being the correct solution of the problem.

If the eye rotates at its equator 50° laterally, 30° upward and 50° downward, the posterior pole and head of the optic nerve must describe the same number of degrees of arc as the anterior pole, which would be impossible for the optic nerve to do on account of the nerve while being flexible, is non-elastic, it would not be capable of stretching to the number of degrees necessary. Besides there is no opening in Tenon's capsule posteriorly for the passage of the nerve in its excursion.

On further study and experiments I have found other undiscovered features, which bear out the theory. I found that in order for the optic nerve to describe the same number of degrees of arc as the anterior pole, it would require the stretching of the optic nerve some 8 millimeters. I have also learned that the posterior pole of the eye can not describe an arc of rotation laterally of 50° , being limited in its movement in the muscle cone to 25° by the optic nerve coming in contact with the recti muscles. As for the ophthalmic ganglion, there would be constant friction and irritation when it is brought in contact with the external rectus muscle, as it lies against the temporal side of the optic nerve midway between the optic foramen and the eye.

Again, if the eye rotated at its equator 50° laterally instead of the cornea swinging to the inner and outer canthi, as it does in its movements, it would revolve directly around the vertical axis to the equatorial plane and bury itself partially in conjunctival folds without making any outward or inward movement as is observed. Then, again, if the eye rotated at its equator, the macula lutea would never be in a

state of rest as it would describe the same number of degrees or arc as the anterior pole, therefore fixed vision and object finding would be difficult.

In the discussion of my paper it was contended that there was not sufficient space in the orbit to permit oscillation of the eyeball, the measurements of the orbital opening being given as 40 millimeters laterally, and 35 millimeters vertically. The disputants failed to recognize that there exists a concavity of considerable degree just back of the orbital margins and that the eyeball does not rest entirely in the orbit, that its equator is about on a line with the external margin. When the eye oscillates its convexity fits into the concavity of the orbit and takes up but little more space than if it rotated at its equator. The distance between the center of rotation and the posterior pole is but 10.5 millimeters, in fact, measuring from the posterior pole it swings laterally 43° instead of 50° , as recorded by Stevens' tropometer.

I differ with authorities as to the action of the recti muscles. The action of the oblique muscles has nothing to do with the tilting of the eye. Their action is rotation. The external rectus steadies the eye in its transverse meridian, while the oblique muscles rotate the eye on its antero-posterior axis, and their function is to maintain erect images vertical in whatever position the eyes are turned, or the head tilted, as images on the macula must correspond accurately, point for point, with each other. Like the muscles of the forefinger, the action of the recti muscles, either singly or in combination, turn the eye in all the degrees of the arc.

The lack of understanding of the etiology of strabismus and errors in operating have been due to a misconception of the muscular action and ocular movements.

In order to prove my claims I have constructed a model mounting an eye in the orbit on the right side of a skull showing rotation, and another in the left orbit demonstrating oscillation. The construction is as near mathematically correct as possible. I also have for your consideration another skull model demonstrating Tenon's capsule on one side, and Tenon's capsule and the orbital fat on the other. Again, I have for your inspection one of Savage's models, which he calls a muscle indicator to demonstrate the theory of rotation. It will clearly show you ocular rotation, movements of the anterior and pos-

terior poles both describing an arc of 50° , and the optic nerve confined and limited within the muscle cone (the latter I have added).

The wax model is for you to note that the center of muscular action of the recti muscles is on a plane with the posterior pole of the eye and corresponds with the theory of oscillation.

Etiologically, aside from squints that are the result of "excessive accommodation of ametropia" (Douders), strabismus is due to an inequality of the relative length of the recti muscles or their faulty insertion.

The last model for consideration is one demonstrating concomitant convergent or divergent strabismus. Landolt says: "That in their movement the two eyes are innervated at the same time and to the same degree. They cannot move independently one from another; they are controlled as if they were a single organ."

110 North Wabash Ave.

DISCUSSION OF DR. GEORGE'S PAPER IN 1915.

EDGAR J. GEORGE: The image on the macula lutea is inverted, and as the rays of light that pass into the eye pass out as they enter, the image is reverted, consequently is seen erect. Images on the macula lutea are maintained vertical or erect by the oblique muscles.

Few realize the immense amount of work I have put upon this subject during the past year. I wish to acknowledge the valuable assistance Dr. Boynton rendered me in preparing these models. My work for next year will be animal experiments with the assistance of Dr. Harpel, physiologist, and Dr. Ford, anatomist of Hahnemann Medical College. At our meeting next year I hope to be able to report results on my work. As to stimulating the muscles by electrolysis, it is to be remembered that electricity does not act upon dead tissue, that it must be applied to the live animal.

W. E. BOYNTON: I have spent considerable time trying to make a model demonstrating the movements of the eyeball under the theory of rotation without removing the posterior half of the eyeball as Dr. Suffa has done, or giving the eyeball but a limited motion as Dr. Savage has done, and it has proven mechanically impossible. It is easy to draw a diagram of the supposed movements and to figure them out by higher mathematics, but when you try to construct a model in which the eyeball is rotated by the ocular muscles giving the eye the full

sweep accredited to it and in which the optic nerve, muscles, etc., are in their proper anatomical relationship you are presented with a very different sort of a task. The ball-and-socket idea is all right till you try to work it out in a model. When you attach the optic nerve to the eyeball and attempt rotation you find that you must change your "socket" to a ring with an ample central opening to admit of the extended excursions of the optic nerve. For it must not be forgotten that in rotation the posterior pole of the eyeball will describe an arc equal to that described by the anterior pole. Your "socket" then becomes annular and situated but slightly posterior to the equator of the eyeball. Now when you attach the ocular muscles in their proper anatomical relations and areas you are confronted by the fact that your annular "socket" will not allow the muscles to act. I hope Dr. George will be able to establish the correctness of his theory for his own credit and for the honor of Homœopathy.

110 No. Wabash Ave.

A MODERN SOLILOQUY.

VIRGINIA FISK GREEN.

To cut or not to cut: that is the question:
 Whether 'tis wiser for an o'er racked frame to suffer
 The tortures of outrageous 'pendicitis,
 Or to take knife against the surly monster
 And by curtailing, kill it. To cut, to slash:
 What more? And by that slash to put an end
 To pain and wipe forever off the slate
 That dreaded organ: 'tis a consummation
 Devoutly to be wish'd. To cut, to slash:
 To slash, perchance to death: ay, there's the rub!
 For in that slash so keen may lie the power
 To make us shuffle off this mortal coil.
 Our too, too solid flesh might melt,
 And we might fain resume existence, when
 We had it not. Doctors and wielders of
 The knife protect us! Till the damn'd thing lies
 At rest in alcohol!—and then we thank thee!

—*Pacific Pharmacist.*

ON OCULAR MOVEMENTS AND THE CENTER OF OCULAR ROTATION.*

J. A. FERREE, M. D., AND CHARLES SHEARD, PH. D.

THE incentive to the investigations and calculations presented in this paper came from the perusal of an article by Edgar George, M. D., on "Ocular Movements," which appeared in the October, 1914, issue of the *Journal of Ophthalmology, Otology and Laryngology*. In that paper Dr. George advanced and attempted the proof of a theory that the macula area is the center of ocular oscillation; this is a radical departure from our commonly accepted notions as to ocular rotations. We have attempted to present in the present paper a considerable number of proofs in evidence of the correctness of the statement that the center of ocular rotation is at or near the geometrical center of the eyeball. For the sake of perspicuity the subject matter is divided into three portions (1) optical, (2) anatomical and, (3) operative. Considerable detail has been indulged in; we hope this may be pardoned in the interests of clearness of thought and of written statement.

I. OPTICAL.

As a basis for the interpretation of subsequent physiological measurements upon living eyes and in order to lay down correct mathematical theorems, artificial physical eyes were constructed consisting of a lens, a screen with a point marked thereon representing the macula and a movable axis of rotation or oscillation. The light sources used in these optical tests were placed twenty or more feet away thus approximating in action the living eye fixing at infinity. The axis of rotation could be so placed with reference to the body of this artificial eye as to enable rotation to be made (1) about a point midway between the macula and the lens and (2) about a point directly under the macula thus making this point the center of oscillation as per Dr. George's theory.

These artificial eyes, thus constructed, were used in two separate

*Read before the Ophthalmological Society of the American Institute of Homœopathy, Baltimore, June, 1916.

and distinct methods of testing the angles through which the optic axis (taken in our experimentation as a line connecting the macula and the central point of the lens which schematically means the center of the cornea) turns in the two modes of rotation, *i. e.*, about the center of the eyeball and about the macula as a fixed point. These experiments and calculations having been made, a series of experiments was conducted upon patients in the laboratory and clinics and the actual arc turned through by an eye in direct fixation upon each of two points at a given distance apart, the patient being seated 20 feet distant, measured carefully by several observers. These experimental values of the actual arc displacements of an eye under the *modus operandi* of the experiments were compared with the theoretical and experimental methods with the artificial eye, with the result that we have concluded that the center of rotation of the eye is at or near the center of the anatomical eye and that it is not at the macula.

ARTIFICIAL EYE—FIRST METHOD.

An artificial eye was constructed using a lens of focal length 17.5 cms.; F , the focal length, is B_1B (Figure 1). An incandescent lamp was placed about 40 feet from this apparatus. A point, B_1 , was arbitrarily chosen and the image of the lamp focussed on B_1 . Keeping B_1 fixed by making it mechanically the center of rotation, the lens-

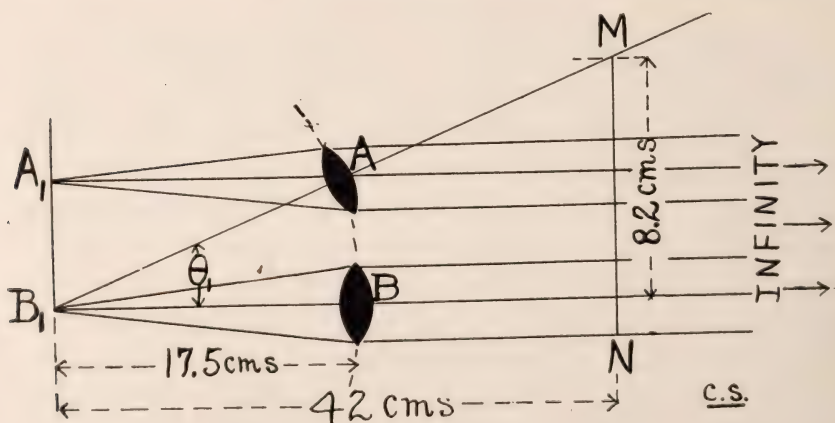


FIGURE 1.

system was then rotated from a position B to a position A such that the image of the lamp fell at A_1 . The apparatus was so arranged that measurements could be taken from the bar $A B_1$ to the bar $B B_1$ over

MN is 6.8 cms. and ON is 32.5 cms. experimentally. Then $\tan \theta_2$
 $\frac{6.8}{32.5}$
 equals — or θ_2 is $11^\circ 50'$. But AB equals A_1B_1 and therefore AB,
 the arc turned through by the cornea, which may be presented by X_2 ,
 can be found from the relation that $\tan 11^\circ 50'$ is $\frac{X_2}{8.7}$

or X_2 equals 1.83 cms. (app.).

We have thus arrived at the conclusion that the angle subtended by the center of the cornea, in moving from the arbitrary primary position into the arbitrary second position with fixation at practical infinity, is the same whether the center of rotation be chosen as the center of the eye or the macula, but that the arcs traversed by the center of the cornea in order that the image may be moved over the same fiducial distance is twice as great in one case as in the other.

ARTIFICIAL EYE—SECOND METHOD.

While these experiments could be put to the test upon patients in the clinics and the validity of one or the other statement as to the location of the center of rotation tested, there might still be some lack of clearness in the above method to the reader of this paper. These same experiments can be performed in another manner with the artificial physical eyes and the general conclusion stated at the end of the preceding paragraph again reached and subjected to clinical demonstration on living eyes.

In these latter experiments two incandescent lamps, L_1 and L_2 , were placed at a distance of 3 feet and 9 inches apart and at a distance, subsequently measured, of 16 feet 8 inches from the lens of the artificial eye. A point on the screen was chosen as an arbitrary macula and is indicated at M_1 in Figures 3 and 4. The procedure was to then focus the image of L_1 upon M_1 in such a manner that the bar carrying the screen and the lens were parallel with and directly over the meter bar to which the artificial eye was fastened. The artificial eye was then rotated, about M_1 as a center in Figure 3, and O, the mid-point, in Figure 4, until the image of L_2 fell upon M_1 . The focus, F, of the lens used was found to be 18 cms. Then, experimentally, M_1B equals 18 cms., AB equals 4 cms. practically (measured

from the bar $M_1 A$ to bar $M_1 B$). If then X_1 represent $A B$, we have

$$\frac{X_1}{M_1 B} = \frac{4}{18} \text{ equals } \frac{4}{18} \text{ equals } \tan \theta_1 \text{ equals } 0.222$$

or θ_1 equals $12^\circ 30'$.

A check measurement made with $M_1 N$ 29 cms. and $M N$ measured

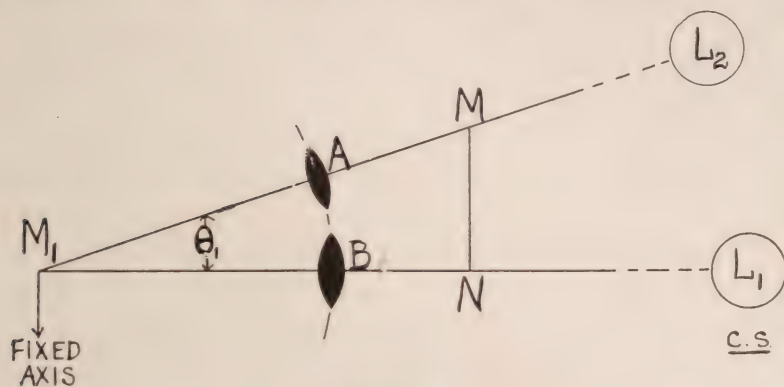


FIGURE 3.

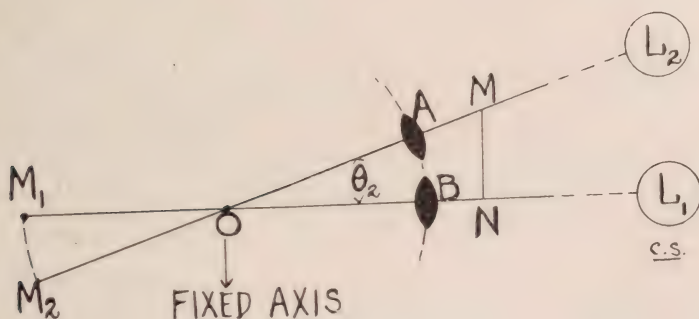


FIGURE 4.

as 6.5 cms. gives $\tan \theta_1$ as 0.228, while from the data $L_1 L_2$ equals 3 feet 9 inches and $M_1 L_1$ equals 17 feet 2 inches, $\tan \theta$ is 0.224.

Figure 4 shows the experimental arrangement with rotation about the central point. The macula M_1 is under the image of L_1 and after rotation it finds itself at M_2 under the image of L_2 . In both these experiments the macula is brought into the direct line of fixation for two different sources or points of fixation.

The data is as follows:— $O B$ equals $O M_1$, equals 9 cms. as experimentally measured. $A B$ equals 2 cms. If then $A B$ is represented

by X_2 , we have $\tan \theta_2$ equals $\frac{X_2}{OB}$, or $\frac{2}{9}$ equals $\tan \theta_2$, equals 0.222.

Check measurements gave MN as 4.5 cms. and ON as 20 cms. Hence $\tan \theta_2$ is 0.225. *We therefore conclude that for fixation at infinity, the angle subtended by the center of the cornea in moving from one arbitrary fixation point to a secondary fixation point, is the same whether the center of the eye or the macula be chosen as the center of rotation, but that the arcs traversed by the center of the cornea in order that the macula may be in the line of fixation in two arbitrarily chosen directions is twice as great in case the macula is chosen as the center of oscillation as compared with its value if the center of the eyeball is taken as the center of rotation.*

These optical experiments and theoretical deductions relative to ocular rotations were put to the test in our clinics in the following simple manner diagrammed in figure 5. Figure 5 represents the optical rotation which we believe is correct; figure 6 represents the condition which must exist if the macula is the center of rotation. Some twenty persons were tested. The method is as follows: Two lamps,

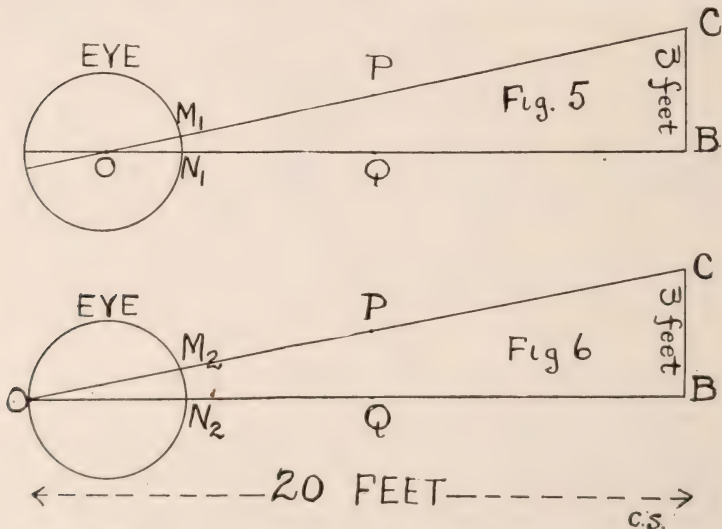


FIGURE 5.

FIGURE 6.

B and C, were fixed at a distance of 3 feet apart, the patient being seated at 20 feet. The patient, with one eye (usually the left) covered, was then instructed to line up or sight a small object, about the size of a lead pencil, with the lamp B. In the same manner, the head

remaining fixed, the lamp C was sighted. The deflexion or arc of rotation of the cornea, measured in nearly every case from the sclero-corneal border, was obtained by the use of a millimeter scale or a strabismometer of the simple, classical form. Since fixation is practically at infinity pupillary reaction under accommodative impulse could not enter in, and, therefore, any point on the cornea could be chosen as a reference point. The results of seven sets of these observations as tabulated below :

Patient.	Deflexion (Average of 5 observations).
B. J.	1.75 mms.
Mrs. C. S.	1.90 "
D. A. W.	1.80 "
A. W. F.	1.75 "
A. B.	1.85 "
A. W. S.	1.80 "
A. D.	1.85 "

Average arc deflexion is 1.80 mms.

For convenience in discussing these results in connection with figures 5 and 6, let

D represent fixation distance, 20 feet.

F represent distance between fixation points, 3 feet.

x represent deflexion of cornea (center of rotation taken as the center of the eye).

y represent deflexion of cornea (macula as center of oscillation).

Then, in Figure 5, let the angle $M_1O N_1$ be θ_1 and in Figure 6 let the $M_2O N_2$ be θ_2 . $M_1 N_1$ and $M_2 N_2$ represent the arcs of deflexion in the two cases.

$$\tan \theta_1 \text{ equals } \frac{F}{D} \text{ equals } \frac{3}{20} \text{ equals } 0.15 \text{ (Figure 5).}$$

$$\tan \theta_2 \text{ equals } \frac{F}{D} \text{ equals } \frac{3}{20} \text{ equals } 0.15 \text{ (Figure 6).}$$

$$\text{Also } \frac{M_1 N_1}{O N_1} \text{ equals } \tan \theta_1 \text{ in Figure 5.}$$

$O N_1$ is 12.5 mms (depth of eyeball assumed to be 25 mms.) and $M_1 N_1$ equals $O N_1 \times \tan \theta_1$ equals 12.5×0.15 , equals 1.87 mms. Again,

$$\frac{M_2 N_2}{O N_2} \text{ equals } \theta_2 \text{ and } O N_2 \text{ is 25 mms.}$$

Hence $M_2 N_2$ equals $O N_2 \times \tan \theta_2$, equals 25×0.15 , equals 3.75 mms.

Therefore, mathematically and experimentally, we conclude that if the eye rotates about its own center and fixes alternately upon two points situated 3 feet apart and 20 feet distant it will be turned through an arc of 1.87 mms., while if the eye rotates about the macula under similar conditions the arc will be 3.75 mms. *Clinical experiments give a value of 1.80 mms., thus being in agreement with the proposition that the eye rotates about its center (at least very close to this point) in all normal ocular movements.*

All physical and clinical experiments thus far described have had to do with fixation at twenty feet or practical infinity. We shall now discuss the strabismometer and the proof which it has supposedly furnished in support of the theory that the motion of the eyeball is oscillation and not rotation as presented by Dr. George in his paper published in the JOURNAL OF OPHTHALMOLOGY, OTOTOLOGY AND LARYNGOLOGY for October, 1914. This strabismometer consists of an arc so placed that the center of the eyeball is said to coincide with the center of curvature of the arc. "Applying the instrument," says Dr. George, "we found the condition shown in figure 2" (l. c. article referred to above) "that the movable pointer marking the radii of the arc did not correspond with the antero-posterior axis of the eyeball in its lateral movements." We are agreed that the most likely and tenable grounds for his conclusions are based on this method of procedure which, however, we believe is inaccurate when used in the manner indicated. Evidently the eye, under the mode of investigation just referred to, is being measured as to its powers of version and its center of rotation by means of a pointer which we presume is so directed as to point toward the center of the pupillary area (if this is the fiducial point chosen) and occupy a position along the radius of rotation of the eye in any chosen position. If this is correct this method is then only a modification of the perimeter or a modi-

fication in its usage. In the first place, let us call attention to the great difficulty and uncertainty of knowing "that the center of the eyeball coincides with the center of curvature of the arc." Considering the depth of the eyeball as being normally 25 mms., an error of 5 mms. in the correct location of this point would certainly introduce large errors as will be seen graphically in figure 7. The only

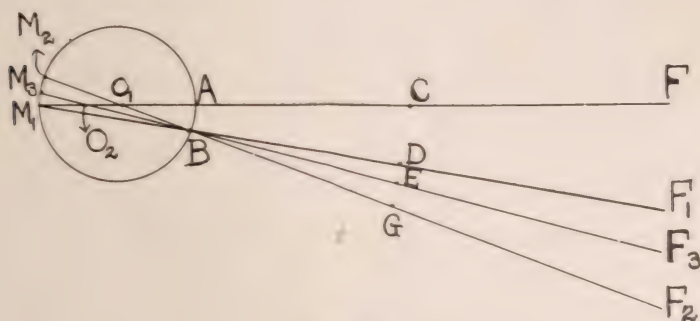


FIGURE 7.

legitimate tests are those involving fixation at infinity. In figure 7 let O_1 represent the center of the eyeball, M_1 the macula if stationary, M_2 the macula if the eye rotates about the center point. AB represents some arbitrary deflection of arc of the cornea. Let F be the fixation point at infinity and let CG represent the arc of the strabismometer with the center of curvature coinciding with the center of the eyeball. Then, as previously pointed out, if the arc AB is kept constant for the two cases of centers of rotation and the eye is verted from A to B , the angle of fixation will be $\angle F O_1 F_2$ if the rotation is about O_1 which is twice as great as the angle of fixation $\angle F M_1 F_1$ with the macula at the center of rotation. Suppose an error is made in the setting of the strabismometer and that its center of curvature is at O_2 . The movable pointer on the strabismometer would then be at D , E or G , as per the three possibilities stated above. We are unable to conceive of the possibility of the pointer being, in any particular experiment, at the same degree point in the three cases as diagrammed by George in figure 6 of the article previously referred to.

Figure 8 is introduced to show the closest approach to mathematical and optical accuracy of which we can conceive and which might be used in support of the theory of a stationary macula. But, as will be shown, the difficulties involved in differentiation between the

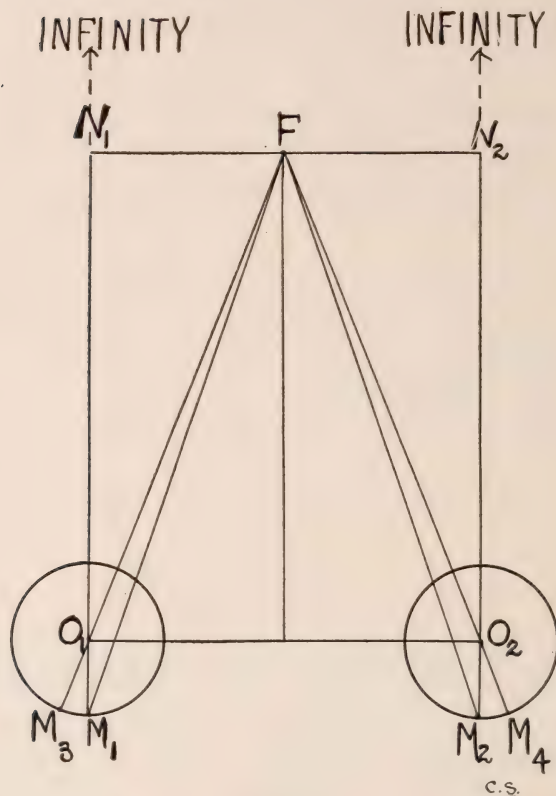


FIGURE 8.

two theories would be well-nigh insurmountable by this method. Let F be a fixation point on the median line at a distance of 33 cms. from each eye, *i. e.*, let O_1F equal O_2F equal 33 cms. and O_1O_2 equal M_1M_2 equal 64 mms. Then the angle N_1O_1F represents the angle of convergence if O_1 is the center of rotation and N_1M_1F is this angle if M_1 , the macula, is stationary.

Trigonometrically,

$$\begin{aligned} \text{sine } N_1 O_1 F \text{ equals } \frac{N_1 F}{O_1 F} & \text{ equals } \frac{\frac{O_1 O_2}{2}}{O_1 F} \text{ equals } \frac{3.2}{33} \\ & \text{ equals } 0.99. \end{aligned}$$

or $N_1 O_1 F$, equals the convergence angle for each eye, equals $5^\circ 45'$

and sine $N_1 M_1 F$ equals $\frac{N_1 F}{M_1 F}$ equals $\frac{M_1 M_2}{2 M_1 F}$ equals $\frac{3.2}{34.3}$ or $N_1 M_1 F$ equals $5^\circ 25'$ (app.).

Similar calculations can be made for other fixation distances, and the conclusion will be reached that the angular differences when O_1 and M_1 are considered as the rotation centers, respectively, are too small to permit of experimental tests in favor of the stationary macula.

We are also unable to see how *duction* tests of the various muscles could be made, or if made have any resemblance whatever to our ordinarily accepted sthenic values of adduction, abduction, et al., if the macula is the center of an oscillatory eye. For if a prism is introduced before an eye oscillating about the macula the result will be that the light entering this eye will be deviated by the prism, say, from position M_2 , in figure 9, to position M_3 , and this *deviated beam of light can*

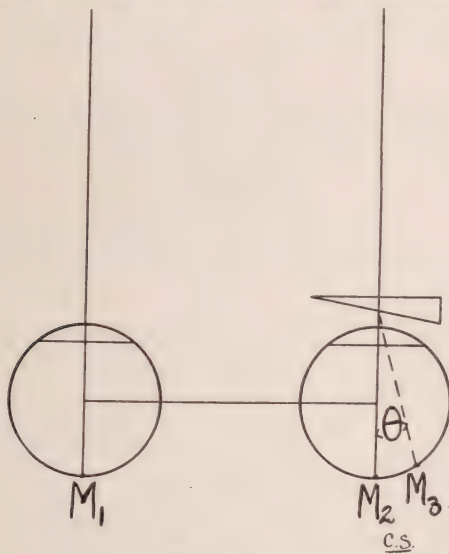


FIGURE 9.

never be made to fall upon the macula by virtue of any rotation or oscillation about the macula. If the normal adducting power, measured at 20 feet, is 25 degrees prism base out, then according to the laws of prismatic action the ray will be deviated 12.5 degrees toward the base of the prism (assuming index of refraction of 1:50.) Let this ray enter the eye under this deviation. If, then, the macula is fixed, a

rotation about this area or point as a center could never bring the deviated ray upon the macula area. If we accept the laws of corresponding retinal points and the methods of determining binocular fusion areas, diplopia of an insuperable amount would result in the case we have just cited. The fovea centralis has a diameter of 0.25 millimeter. Taking the depth of the eye as 25 mms., we find that it is necessary, in order that the ray deviated by a prism shall touch the edge

of a stationary fœva, to make $\tan \theta$ equal to $\frac{0.12}{25}$ or 0.005, hence θ

would be 17 minutes as a maximum. Since the deviation is practically one-half the degree value of the prism producing it, a one-half degree prism (approximately), either base in or out, up or down, would be the limiting value of the prism which could be placed before the eye in any cardinal position and not produce diplopia. Or if we assume that any points on the true macula may function as corresponding points (which is doubtful), then, since the diameter of the true macula is

1 mm., $\tan \theta$ equals $\frac{0.5}{25}$ or 0.02, or θ equals $1^\circ 10'$, and the maximum

prism which could be employed, assuming a stationary macula, without producing diplopia would be $2^\circ 20'$.

II. ANATOMICAL.

Dr. George made the following statements in his paper read in June, 1914:

"Normally, the movements of the eye (according to Stevens' tropometer) are 40° to 50° nasalward and temporalward, upward 25° to 30° , downward 40° to 50° . If we assume as heretofore that the rotation of the eye is at its equator, the posterior segment of the eye must move the same number of degrees of the arc as the anterior. *This would be impossible in view of the fact that while the optic nerve and its sheaths are flexible, they are non-elastic, consequently are not capable of stretching sufficiently to allow the head of the optic nerve to describe an arc corresponding to that described by the anterior pole.*" The italicized portion of the above quotation (italics are due to writers of this paper) is, the writers believe, a rather bold assertion for the following reasons:

- (1) We have no evidence that the optic nerve, from the foramen

forward to its anterior attachment to the bulb, is normally in a taut or tonic condition. Nature has most certainly provided for a sufficient length of optic nerve from the foramen forward to permit of the maximum excursions of the eye. There is probably some stretching but also some simple "taking up of slack," if we may be pardoned such an expression, due to the laying down of the nerve in the letter S shape. Let us calculate, mathematically, the actual linear dimensions of the optic nerve when the eye is in its primary fixation position and when it has been abverted (turned temporalward) 50 degrees on the assumption that the optic nerve is taut in both positions and that there will, therefore, be a stretching of this nerve when the eye is abverted. The difference between these numerical figures will give us the *maximum* change in linear dimensions of the paths occupied by the optic nerve in the two positions, or will give us the maximum amount of stretching if the change in length is due wholly to this factor. We say

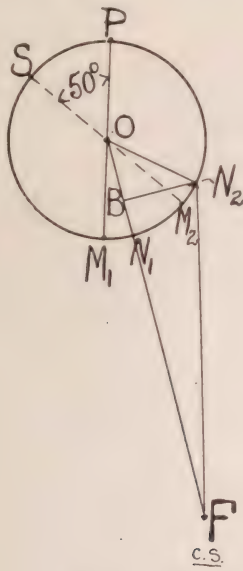


FIGURE 10.

it will give the maximum value if the abversion of 50 degrees is taken for the reason that the optic nerve is attached about 10 degrees nasalward of the visual axis, hence an adversion of 50 degrees will mean virtually only an excursion of practically 30 degrees beyond the corresponding position on the temporal side, when the optic nerve has been rotated posteriorly from its primary position, 50 degrees temporally.

Figure 10 represents an eye with O as its center of rotation. The primary visual axis is P M₁, and after an abversion of 50 degrees, represented by the angle P O S, this axis assumes the position S M₂. The letter F represents the position of the optic foramen and F N₁ and F N₂ represent graphically the dimensional lengths of the optic nerve under an abversion of 50 degrees. The angle N₂ O N₁ is, therefore, 50 degrees; so also is the angle N₂ O B since it is identically the same angle. We have taken the length of the optic nerve in the position F N₁ as 28 mms.; the calculations which follow will not be materially changed if a shorter or longer length is chosen. A dissection of the orbital cavity and a careful removal of the optic nerve from a fresh cadaver gave us length of 30 mms. and 36 mms., respectively. F N₂ represents its length in the second position in figure 10. O N₂ the radius of the eyeball, is again taken as 12 mms.

$$\text{Trigonometrically, } \frac{OB}{ON_2} \text{ equals } \cos 50^\circ$$

$$\text{or } OB \text{ equals } 12 \times 0.643 \text{ equals } 7.8 \text{ mms.}$$

$$\text{Hence } BN_1 \text{ equals } 12 - 7.8, \text{ or } 4.2 \text{ mms.}$$

$$\text{Also } \frac{BN_2}{ON_2} \text{ equals } \sin 50^\circ$$

$$\text{or } BN_2 \text{ equals } 12 \times 0.766, \text{ or } 9.2 \text{ mms.}$$

$$\begin{aligned} \text{Again, } FN_2 &= (BF^2 + BN_2^2)^{\frac{1}{2}} \\ &= [(3.2)^2 + (9.2)^2]^{\frac{1}{2}} \end{aligned}$$

$$\text{or } FN_2 \text{ is } 33.5 \text{ mms.}$$

Hence the maximum increase in path dimensions or in actual stretching if such is the case of the optic nerve under the maximum version amounts to 33.5 mms. — 28 mms. or 5.5 mms. We shall now present reasons for believing that this extreme value is never more than partially demanded and furthermore that it can actually exceed this value by citing exophthalmic cases.

(2) Maddox (Tests and Studies of the Ocular Muscles, 2nd Edition, 1907, pg. 34), says:—

"If we regard the head as fixed and confine ourselves to the study of the voluntary motions of the eyeball, we shall find it approximately true that translation of the globe is forbidden in virtue of the attachments to the orbit. Were we to investigate this statement very strictly

we should not, however, find it rigidly true, since the center of motion lies a little farther back than the geometrical center of the eyeball, in consequence of which the globe is slightly translated in whatever direction the eye is made to turn. On looking to the right, the globe is translated slightly to the right; on looking to the left, to the left and so on. In the *maximum excursions of the eye this translation is probably not less than 1 or greater than 2 millimeters.*" (Italics due to the authors of this paper.) By referring to Figure 10 we can see that a translation of 2 mms. will practically reduce the real value of BN_2 from 9.2 mms. to 7.2 mms. and by a calculation similar to that employed in the preceding paragraph we find that the value of FN_2 comes out 33 mms.; hence the probable translation would reduce the amount of extension or increase in path dimensions from 5.5 mms. to 5 mms.,—indicating less needed extensibility.

(3) We quote from George's paper the following:—

"Tenon's capsule is virtually an *inelastic* diaphragm in which the eyeball rests as in a hammock. . . . Tenon's capsule also forms a sheath for the optic nerve, envelops the vessels and nerves and intermingles with the soft fat that fills the orbital cavity. It is separated by a lymph space into two layers, the visceral and parietal layers, lined with endothelium which facilitates the free movement of these layers upon each other. . . . The movement of the eyeball does not take place within the capsule, but between the visceral and parietal layers, friction being overcome by the endothelium lining and the lymph between, the center of rotation being the macular region."

Maddox, on page 20 of his book on Ocular Muscles, says:—

"These two eye investing membranes are regarded as forming one capsule, known as Tenon's external capsule. It sends prolongation backwards in the form of a sheath for the optic nerve and for the various vessels and nerves which enter the eye and though nothing more than a part of the common aponeurosis of the eye, is endowed with *remarkable elasticity.*"

We have here two diametrically opposite opinions as to the nature of Tenon's capsule; one says it is *virtually inelastic* and the other that it is *endowed with remarkable elasticity.*

And again, to quote briefly from The American Encyclopedia of Ophthalmology, Vol. II, page 1392:—

"The tarso-orbital fascia, according to most writers, forms the capsule of Tenon; a thin, translucent fibrous membrane, which covers the posterior two-thirds of the globe from the tendinous insertion of the straight muscles which pass through it to the optic nerve, with the external sheath of which it is identical. A second layer separates the eyeball from the bed of fat upon which it rests." . . . "It is taught (see Norris and Oliver's System, Vol. I, page 99), as by common consent that the capsule of Tenon is a socket in which the eyeball rotates without change of position, except, perhaps, that under certain conditions it may move a minute distance forward or backward. Anatomy shows that this is impossible. It is easy to see that as Tenon's capsule is closely attached to the globe near the cornea, it is out of the question that *the former should stand still while the latter moves in it*. Undoubtedly the two move together on the cushion of fat behind them and perhaps some slight motion may occur between them. The muscles pierce, or more properly, invaginate this membrane."

(4) Cases of exophthalmos show that there may be a proptosis of the eyeball, varying in amount from 2 mms. to 15 mms., without destruction of the optic nerve, clearly proving that there is anatomically ample provision normally for the optic nerve to either stretch or mechanically take up slack or do both when the eyeball rotates about its center. The following quotations are taken from Volume VII of the American Encyclopedia of Ophthalmology:—

"Exophthalmos, intermittent. Posey reports a case in which a young adult could in this manner (by leaning forward or by act of blowing) voluntarily proptose the left eyeball *fifteen millimeters* in advance of its fellow. The cause is presumably some varicose condition of the veins of the orbit."

"A careful analysis of a case is reported by Birch-Hirschfeld and Romeick (Klin. Monatsbl. f. Augenheilk., April, 1912). It was caused by a retrobulbar varix which in stooping had produced by venous stasis an exophthalmos of 2.50 mms., if this position were prolonged it was *increased to 6 mms.* The etiological element was attributed to abnormal narrowness of the anterior efferent paths."

"Colombo (Ann. di Otto, Vol. 42, p. 602) reports a case of intermittent exophthalmos in a girl of twelve years. . . . The eye

was exophthalmic 1.5 centimeters, and the movements of the bulb were limited in all directions." It is to be noted that even with this excessive exophthalmos the ocular movements were not inhibited completely but were limited.

"Exophthalmos, Voluntary. Proptosis can occasionally be induced at will. A classic example is that of a man, aged 19, who consulted Barrière (Klin. Monatsbl. f. Augenheilk, March, 1913) on account of an exophthalmos of the right eye and complained of diplopia during mastication. The exophthalmos (5 mms.) had existed from the first years of life and gradually progressed. When the patient pressed the jaws together an increase of exophthalmus of 2.5 mms. was noticed."

All of these cases go to prove conclusively that there is either sufficient elasticity in the sheaths of the optic nerve or sufficient surplus length thereof to permit of large amounts, relatively, of exophthalmos without destruction of the optic nerve and complete limitation of ocular movements.

(5) The *maximum verting power* of the extra-ocular muscles as measured by the Stevens tropometer would be absolutely impossible on the basis of George's theory of the macula as the center of eye movement. Figure II and the accompanying discussion will make

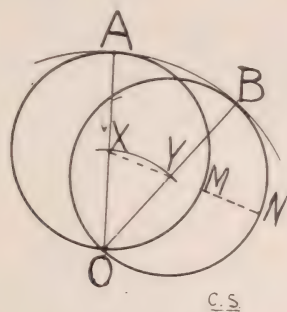


FIGURE II.

this clear. O represents the fixed macula as per the above theory. A O represents the primary position of the visual axis and O B the position of that axis when an eye oscillates about the point O so as to sweep through an angle A O B equal to 50° . We are interested in calculating the lateral displacement which the eyeball would suffer under such a regime. Graphically this is represented by the line X Y

connecting the centers of the two positions or M N which is the equal of X Y.

Then A O, equals O B, equals 24 mms., depth of eyeball; also M N equals X Y.

$$\text{Then } \frac{\text{arc A B}}{\text{A O}} \text{ equals } \frac{\text{arc X Y}}{\text{X O}} \text{ equals angle A O B in radians}$$

since the radius multiplied by the angle in radians is equal to the arc. One radian is 57.3° .

$$\text{Therefore, X Y equals } 12 \times \frac{50^\circ}{57.3} \text{ equals } 10.5 \text{ mms. This cal-}$$

culation shows that if the eye oscillates about the macula as a fixed point and if the maximum lateral verting angle be assumed as 50° , there would then be a *lateral equatorial displacement of an eye under such conditions of approximately 11 millimeters*. Such a displacement would be an absolute impossibility, for the maximum diameter of the orbit is $1\frac{3}{4}$ inches or 43 mms. approximately; the diameter of the eyeball is 24 mms.; the eyeball is approximately centered in the orbital cavity equatorially; the semi-diameter of the eyeball is 12 mms.; the difference is 10 mms. This statement, taken in connection with the calculations made above, would mean that at or near the maximum verted position of an eye there could be absolutely nothing between the eyeball and the orbital bone formations, all tissues would have to possess infinite compressibility or zero coefficient of compressibility or would have to be in such a fluid condition as to be circulated from one side of the eye to the other with extreme rapidity. Such a condition of affairs is unthinkable.

III. OPERATIVE.

In concluding this paper we wish to show that the technique of operative procedure and treatment, as described by Dr. George, is based upon the assumption that the center of ocular rotations is practically the geometrical center of the eyeball and not the macula, as he asserts, and upon which he bases "the mathematical accuracy" of his strabismus operations. We do not desire to discuss the question of the probable merit of his operative procedure, but we do take exception to the following statement from a paper, entitled "Two Strabismus Cases," by George and Boynton, which says:

"The value of the tropometer findings is very evident in these two cases; (a)..... (b)..... (c)..... (d) by furnishing the above information, reducing the operative measures to a precise mathematical basis, etc." There probably never will be devised any basis, either precise or mathematical, to say nothing of a precise mathematical basis. Certainly George's theory omits several vital considerations, (1) the action of check ligaments, (2) the nerve innervations before and after operation, (3) the impossibility of keeping Nature's hand out after the operation has been performed."

Dr. George, in his paper published in October, 1914, says:

"In operating it requires both a recession and shortening of the external and internal muscles 1 millimeter for every 5 degrees of arc."

He correctly states that the circumference of the eyeball is about 72 mms. and that 360° divided by 72 equals 5° and therefore from this viewpoint alone the combination recession and shortening of the tendons of the external and internal muscles one millimeter each will change the position of the eyeball 5° , but the recession or shortening of one muscle only one millimeter will accomplish the correction of 2.5° owing to the traction of the opposing muscle.

Figure 12 and the following calculations will demonstrate, how-

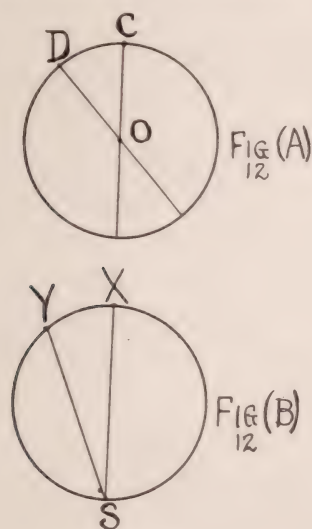


FIGURE 12.

ever, that the proposition of "1 millimeter each of recession and shortening to every 5 degrees of arc" must be based upon the ordinarily

accepted views as to the center of ocular rotations. Figures (A) and (B) represent the centers of rotation as at the geometrical center and at the macula. Suppose then that the extra-ocular muscles are operated upon; let us assume that the full effect of recession and shortening acts to move the eye from the position C to D in Figure 12 (A) and from X to Y in Figure 12 (B). Then a recession of one lateral muscle 1 mm. and a shortening of its antagonists 1 mm. will, according to the above theory, rotate the eyeball exactly 1 millimeter. Let D C in Figure 12 (A) represent 1 millimeter of arc and O its center of rotation. Then, since the radius multiplied by the angle in radians is equal to the arc and since the radius of the eyeball is 12 mms.,

$$\frac{DC}{DO} \text{ equals the angle } D O C \text{ in radians.}$$

Then angle D O C equals $\frac{1}{12} \times 57.3^\circ$ or 5° practically. Again, in Figure 12 (B), with S, the fixed macula, as the center of movement, we have

$$\frac{XY}{YS} \text{ equals angle } Y S X \text{ in radians}$$

or the angle Y S X equals $\frac{1}{24} \times 57.3^\circ$ or 2.5° practically. From these calculations and considerations we are forced to the conclusion that if the "1 millimeter recession and 1 millimeter shortening to 5° of arc" is to hold it must be based upon the acceptance of the geometrical as the rotational center of the eye.

The Ohio State University, Department of Applied Optics, Department of Ophthalmology of the Homœopathic College, June, 1916.

SOME PRACTICAL EXPERIMENTS TO DETERMINE THE CENTER OF RO- TATION OF THE EYEBALL.

DEAN W. MYERS,

Ann Arbor, Mich.

DEAN W. MYERS: This experiment which I am about to show upon the screen was first suggested by Dr. W. O. Bell, of Seattle, a member of the committee. He suggested that if we could get a suitable blind eye, one that was to be enucleated, transfix it with a needle and then make a series of X-ray plates rotating the eyeball in different positions, it would prove or disprove the contention. So far as I know, this is the first time this experiment has ever been done; certainly it is the first time it has ever been done for the purpose of demonstrating the motion of the eyeball in the orbit, whether it rotates or oscillates.

On March 25, 1916, a suitable case presented in the eye clinic of the Homœopathic Hospital of the University of Michigan. The right eye of the patient had been injured two or three years previously, cornea scarred, pupil occluded, vision gone and a chronically irritated ball remaining. The nature of our proposed experiment was carefully explained to the patient who readily consented to "trade his trouble for board and room." The eye was an ideal one for the test, having retained its normal shape and movements. I am sure our technique might have been better, and I hope some day soon to repeat the experiment with better results, although I think you will agree that the first was very satisfactory. The method of procedure was about as follows:

The patient was first prepared for general anesthesia and enucleation. One H. M. C. injection was given an hour before the operation. A few minutes before inserting the needle adrenalin 1 to 1,000 followed by 4 per cent. cocain solution was instilled into the conjunctival cul-de-sac. In about five minutes after the cocain had been instilled, a long hypodermic needle carried five minims of a one per cent. solution of novocaine into the orbit behind the ball, going in at the inner canthus just below the internal rectus. Thinking, perhaps, this anes-

thesia might not be sufficient to deaden the posterior pole of the globe, we selected a large calibre hypodermic needle with which to transfix the ball with the idea in mind that more cocain or novocain might be carried through this needle if necessary, and thus make the one needle answer a double purpose. However, this needle was found to be too blunt and would not readily pass through the cornea and lens. Therefore, a straight, rather large sized sewing needle was substituted, and no trouble was experienced in passing this directly



FIG. 1. Lateral view showing vert. rotation of eye ball.

through the cornea, lens and vitreous to the posterior pole. Its transfixion of the posterior pole was readily recognized by the response of the eyeball to the motion of the needle in the hand of the operator. A shot was then fastened upon the needle at the corneal surface. With the patient sitting at the end of the table his chin resting upon the plate, a five second exposure was made with the patient looking as far

to the right as possible. Then without moving the head the patient was asked to look as far to the left as possible, and five seconds more exposure given. The eye rotated itself carrying the needle with it, the operator's hand being about twelve inches in front of the face and serving only as an object at which the patient might direct his gaze with the good eye. Several plates were made in this position, some of which show very satisfactory shadows of the needle. The patient suffered no inconvenience whatever, in fact, was quite interested in the



FIG. 2. Same as Fig. 1 with larger needle.

results, as much so as one could be after an hour's entertainment of an H. M. C. tablet. These plates were developed at once and before the needle was withdrawn. Observing that the shadow was rather dim it was decided to try a larger needle. Consequently the first was withdrawn and one much heavier inserted. The same procedure was then repeated. Later, the patient's head was turned upon the side

and exposures taken with the eyes looking upward and downward. These later pictures you will observe are much better, the shadows of the needle being more distinct because of the lessened density of bone in this direction.

Measuring these pictures and also that of the eyeball after its removal with the needle in place we find that this globe was 27 mm. from the anterior surface of the cornea to the outside of the sclera at the posterior pole—measuring from the cornea to the cross in the two shadows of the needle we find that the *center of rotation* in this eye was 15 mm. back of the cornea and 12 mm. in front of the macula.

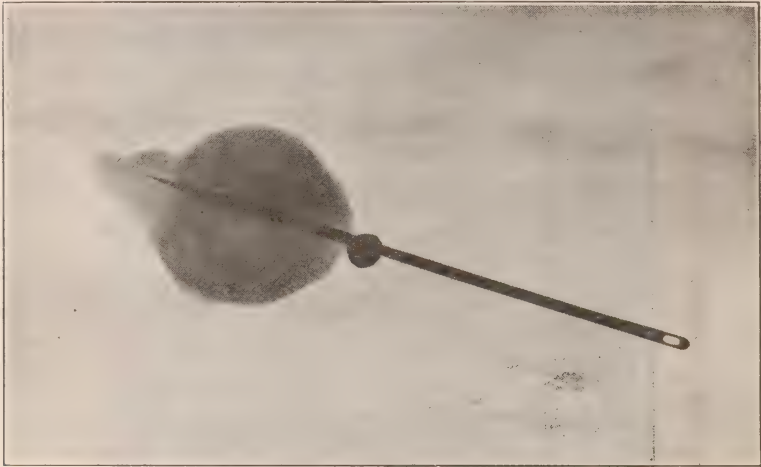


FIG. 3. Eye ball after removal with needle in situ.

We have allowed two mm. for shrinkage in these figures. The X-ray of the globe after its removal will be seen to be 25 mm. in antero-posterior diameter.

I was honored upon the occasion of this experiment by the presence of our president, Dr. W. H. Phillips; ex-president, Dr. Burton Haseltine; secretary, Dr. I. O. Denman, and Dr. J. R. McCleary. The X-ray work was in charge of Dr. H. M. Beebe and Dr. C. C. Thomas.

Immediately following the X-ray work the eye was enucleated, the patient being etherized for this purpose, the eye being taken out with the needle still in place.

Parenthetically speaking, I might remark that "my guests of the day" contributed generously to the bank account of the young man who made these pictures possible.

BURTON HASELTINE: But Dr. Myers gave us a good dinner afterwards.

DEAN W. MYERS: As you see the pictures are plenty good enough to demonstrate that the center of motion of the eye is within the ball and not behind it. The needles are shown crossed in both the plates. The exposure from above is recognized as a most difficult one to take.

PRESIDENT: The discussion is to be opened by Dr. Edgar George. Is Dr. George present? If not, the subject is open to general discussion.

G. W. MACKENZIE: I move that the society accept the report of the committee to investigate Dr. George's theory as conclusive, and that it proves the falsity of Dr. George's theory. Seconded.

C. A. HARKNESS: Whether the theory of oscillation is correct or not I am not attempting to say at this time, as it seems to me to be open to much discussion in spite of the most scientific paper we have heard and the pictures we have seen, which it is admitted were taken under difficulties. But it does seem to me that we are acting hastily in this matter. Dr. George submitted further proofs last year, which do not seem to have been taken into consideration by the committee. He also is securing clinical results which are better than any secured under the old theory. This makes me feel that perhaps he is right in spite of the exact mathematical figures submitted. As to why Dr. George is not here I think I know. He was not furnished with a copy of the committee's report so that he had no chance to prepare an answer or arrange a discussion of its report. I feel that it would be a very great mistake to accept this motion as it has been made as it not only will drive out of the society some of our good men, but might put the society on record as having disproven something that may soon be proven correct. It seems to me that it should at least be held open another year till Dr. George has been given a fair chance to study the committee's report and has a chance to answer it or accept it as proving him wrong.

BURTON HASELTINE: I do not think that our voting yes or no will settle the question whether two and two make four or six. I am not in favor of putting ourselves on record as settling this matter by a vote. Anyone who has followed this demonstration of the X-ray must be convinced by his senses which is the right view, but a vote will prove nothing; it is simply an expression of the opinion of the

majority. Really we are or ought to be obliged to Dr. George for having brought out some new angles of view on an old subject and given us food for thought. The work of the committee **was** splendid and speaks for itself; with the X-ray plates any man can see the truth of the question and to vote that it is true is silly. A vote is useless, I would simply publish the whole thing.

G. A. MACKENZIE: I made that motion for a purpose; so long as Dr. George is a member of this society and the JOURNAL remains its official organ, the editor is compelled to publish his article as presented. His paper has been held, awaiting the report of this committee of investigation or research. My motion was that this report had been accepted and had proved conclusively that Dr. George's theory was wrong so that I may be able to tell Dr. George why his article has not been published.

BURTON HASELTINE: I beg pardon, but that paper has already been published. I am not in opposition to the work of this committee, but in favor of it, but I am opposed to going on record as voting that a self-evident proposition is true. To vote that we have settled it is silly, as silly as to vote that two and two make four.

G. A. MACKENZIE: The article referred to is the one read last year at the Chicago meeting.

DEAN W. MYERS: He did not change his main contention at all. He made his report and showed models which were to demonstrate his original idea. His models showed the optic nerve as a fixed point: he fixed it in the model with a ring and thus was able to oscillate the eyeball up and down or laterally. It was the contention of the committee that you can make a model do anything you want it to do.

G. W. MACKENZIE: If Dr. George is absolutely certain of his theory, he could defend it against anything. He does not need to have the report of the committee first.

J. A. FERREE: There was no intention of withholding the report from Dr. George, we simply did not have the time. We had been informed by a member of this Society that the line of work we were doing had been done, so until we could determine this point we were delayed until the time was too short.

F. G. RITCHIE: In a paper that I read at the Atlantic City meeting the same conclusions were reached.

G. A. SUFFA: I also had an article there in which I quoted

standard authorities and arrived at the same conclusion as that arrived at by the committee.

J. A. FERREE: We do not vote it true, but we simply vote that we believe it to be true or false. If the members are satisfied with the work of the committee they will vote yes, if not, no.

G. A. SUFFA: The fact that Dr. George gets good operative results can have no bearing on his theory in any way. Although I consider some parts of Dr. George's operative procedure faulty, especially the tenotomizing of an internes as the first operation in addition to tucking an externes for convergent strabismus, he would get results way ahead of those obtained by the old tenotomy operation of the internes. I understood Dr. Ferree to say that there were discrepancies in some of his formulæ. Was this not due to the fact that the center of the retinal curve was not used at the starting point in making the deductions? The X-ray plates exhibited by this Committee are certainly very interesting and show conclusively that there is nothing in ocular oscillation and positively prove Dr. Savage's claim that the radius of the retinal curve is the center of rotation in ocular movements.

BURTON HASELTINE: We are not discussing whether the theory is right or not. My objection to passing the motion we are discussing is that it is foolish to pass a resolution declaring an exiomatic statement to be true. Anyone can see it is true without a motion to that effect. Suppose twenty-five men vote that two and two make four, that does not make it any truer, does it?

PRESIDENT: It would be perfectly proper for us to pass Dr. Mackenzie's motion.

BURTON HASELTINE: One man says that tonsil enucleation is a good thing, another man declares it is not: do you think it would settle the question to vote one way or the other?

GEORGE W. McDOWELL: Why not vote that on the evidence as presented Dr. George's theory is not proven.

G. A. MACKENZIE: I accept the amendment.

BURTON HASELTINE: You will have to make it a substitute motion.

G. W. MACKENZIE: I wish Dr. McDowell would make it: so I withdraw my motion.

G. W. McDOWELL: I move as a substitute that the society having heard Dr. George's papers and the report of the committee to investigate the same hereby accept the report of the committee, and do not consider that Dr. George's contention has been proved. Seconded. Carried.

317 S. State St.

Treatment of Tonsillitis.—Lapat deals with tonsillitis as a local infection in the first few hours, and uses application to destroy the bacilli and their toxins. He has found hydrogen peroxid and a solution of iodine, 15 per cent., the best for the purpose. He removes the exudation from the tonsils by swabbing with hydrogen peroxid and then on another swab applies iodine to the crypts. These applications are made twice a day, care being taken that no iodine runs down into the pharynx. The throat is sprayed every two hours with the following solution:

R. Ichthyolis ℥ii.
 Olei Anisi Miii.
 Aquæ ad. ℥ii.

"To be used as a spray every two hours."—*Critic and Guide*.

REPORT OF A CASE OF SINUS THROMBOSIS.

W. H. PHILLIPS, M. D.,

Cleveland, Ohio.

FLORENCE F., age eight years, was seen June 30, 1916, in consultation with Dr. Claude Waltz. Ten days before she had developed an acute otitis media. Dr. Waltz made a paracentesis promptly and the ear discharged freely for several days without pain and but slight temperature. Then pain occurred and the temperature rose as high as 104° ; no history of chills could be obtained; tenderness developed over mastoid.

I saw the child with Dr. Waltz about 11 A. M. on the 30th, and found a well-developed girl apparently suffering considerably; general septic appearance; perspiring freely; temperature 100.2° ; pulse 120; right ear discharging profusely; the mastoid exceedingly sensitive to touch over its entire surface and over the emissary vein.

Dr. Waltz reported that at various times in the past he had found albumin in the urine and had detected a mitral murmur.

She was sent to the hospital at once, and the following morning a simple mastoidectomy was done under ether. The nurse reported that for some reason it was impossible before operating to obtain a specimen of the urine, probably because of its loss with bowel movement. At the operation extensive destruction of the mastoid was found and at the knee of the sinus a peri-sinus abscess. The sinus wall was covered with granulations, but otherwise appeared normal. During the freeing of the sinus, the emissary vein was injured close to the sinus wall and profuse bleeding occurred, which, however, was easily controlled.

A culture was taken; the wound packed with iodoform wicking and covered with moist saline dressings. Culture showed streptococcic infection. Twelve hours later she voided twelve ounces of urine; was very restless; vomiting; temperature 101.6° R. During the next 24 hours she passed 28 ounces of bloody urine showing considerable albumin; temperature 100° to 100.8° ; restless, but fairly comfortable.

July 3rd at 8 A. M. her temperature was 98.8° ; pulse 116; wound dressed and apparently doing well; tongue heavily coated; septic in appearance; 20 gr. sodium bicarbonate in water per rectum every six hours.

At 11:30 A. M. chill followed by emesis; temperature 103.2° R.; one hour later perspiring freely During the day she passed small quantities, from one to six ounces, of bloody urine.

At 9 P. M. another chill lasting 10 minutes; temperature 105° R. Bowels were moved freely by cascara, and she was given cantharis 3x and saline drip.

July 4th, very restless and a little delirious; involuntary urination; emesis; temperature at 4 P. M. 99.4° R.; at 7 P. M. 103.6° R. Taken in connection with the findings at operation there was little doubt in my own mind as to the presence of a thrombosis, but the acute nephritis present complicated matters. A culture from the urine showed bacillus pyocyaneus, and a slide showed numerous streptococci and a few biscuit-shaped cocci. After consultation with Dr. Waltz it was decided to wait a short time before opening up the sinus to study the kidney condition. The bowels were moved freely again; terebinth 6x given with hot packs.

July 5th, complains of headache for the first time; emesis; chills; temperature from 101.8° to 105° R.

July 6th, urine more profuse but still bloody, and containing much albumin; temperature 6 A. M. 99° R. During the day refused nourishment and medicine; involuntary urination; 4 P. M. chill; temperature 104° R.

At 8 P. M. on same day taken to the surgery and under nitrous oxide and oxygen the wound was reopened. The entire wound seemed filling with healthy granulation. Exploration about the knee of the sinus was followed again by profuse bleeding from the emissary vein; compression was made in the area and the bony opening over the sinus enlarged below and above. It was a question at this time whether or not the jugular should be ligated before proceeding further, but the child's condition was so critical that it was decided to limit our work to exploration of the sinus.

Therefore, under compression, it was slit longitudinally. On relaxing compression above no bleeding occurred from the sinus, but the emissary vein bled profusely. Below no bleeding occurred. With

a curette bleeding was easily established from above, but not from below until the curette had been passed into the bulb.

With free bleeding established the sinus was packed and the patient returned to bed.

July 7th at 11 A. M. chilly; temperature 103° R.; moans in her sleep; white count 14,000; passed two ounces of bloody urine; at 5 P. M. temperature 105° R.; urotropin, grains v, every four hours; aconite; saline drip continuously; at 8 P. M. temperature 99.6° R.; and wants nourishment.

July 8th, involuntary urination; sleeps considerably; does not want to be disturbed; temperature at 8 A. M. 99° R.; passed a fairly comfortable day, but at 10 P. M. slight chilliness; temperature 103.4° R.

On July 9th a dressing was done. There was no bleeding from the sinus on removing the packs; at 2 P. M. chill; delirious; temperature 104.2° R.; blood count 45,000; at 5 P. M. 20 c. c. antistreptococcic serum injected between the scapulæ.

July 10th, the highest temperature was 101.2° R. during day, but at 10 P. M.; chill and temperature 104° R.

July 11th, 10 c. c. antistreptococcic serum. Differential count = polymorphonuclears 89 per cent., mononuclears and lymphocytes 5 per cent., eosinophiles 1 per cent. In the afternoon 10 c. c. more serum injected; highest temperature this day was 100.2° R.; white count 24,000.

July 12th looks and feels much better; 20 c. c. serum given; highest temperature this day 99.2° ; urine still bloody and scanty.

July 13th 20 c. c. serum injected; feels and acts much better; takes nourishment well; white count 28,500; highest temperature 101° R. at noon.

July 14th still passing bloody, scanty urine; at 9 A. M. 20 c. c. serum given; at 2 P. M. chill; temperature 104.5° R. Widal test negative; blood count 44,000.

At this point Dr. Fred'k Aeberli was asked to see the patient to determine, if possible, what relation the nephritis might bear to the case. A lumbar puncture at this time was negative so far as increased pressure or meningeal infection was concerned.

July 16th was a repetition of previous days; chill; temperature 103.6° R.; and after consultation with Drs. Waltz and Aeberli it was decided to ignore the kidney lesion, reopen the wound and resect the

jugular. This was done the following morning under nitrous oxide and oxygen anesthesia.

Before touching the mastoid wound, the jugular was resected from below the inferior thyroid branch to above the facial. From the upper end no blood escaped before ligature. All cut ends were touched with carbolic acid, the wound flooded with antistreptococcic serum and closed with cigarette drain at the upper and lower angles. The mastoid wound was then re opened. From the lower end of the sinus pus could be expressed. The upper seemed well sealed and healthy. With a curette the bulb was emptied as far as possible of its decomposing clot, flushed out and filled with serum. The entire wound was flooded with serum and dressed open. During the succeeding four weeks the patient carried a temperature varying from 99° to 103.4° R. The neck wound healed rapidly by first intention. The mastoid wound filled in nicely, and after a week's time no more pus could be drained from the bulb. All after dressings were done with the serum. The urine cleared up gradually, although small amounts of albumin were found two months later.

The interesting features in the case are the complicating nephritis and the effect of the antistreptococcic serum. The nephritis evidently was an acute ether nephritis grafted on to an old chronic disquamative kidney lesion, and may have been a chronic bacillus pyocyaneus infection. The presence of the streptococci in the urine, however, seemed to argue strongly in favor of a sinus lesion and to rule out the kidney as the factor in the temperature rises and the chills, especially as the urine reports do not show the presence of pus in any quantities. How much the injury to the emissory vein had to do with the sinus lesion would be difficult to say. From the high temperature, the profuse perspiration and the general septic appearance at the time I saw her first, and the findings at operation, I am sure there was a bulb thrombosis before the primary mastoidectomy. Besides, the bleeding from the emissory vein was more profuse than I had ever seen before, and for the moment it seemed as though the sinus had been ripped wide open. This was likely due to the obstruction to the flow at the bulb. The introduction of 80 to 100 c. c. antistreptococcic serum made a remarkable difference in the child's condition. While its effect was only temporary yet at a critical period it so raised her resistance that she went through the jugular resection and the later attention to the

REPORT OF A CASE OF SINUS THROMBOSIS.

sinus wound without the slightest difficulty, while the preliminary sinus resection was accomplished only under the greatest difficulty and constant apprehension on the part of the operator and anesthetist. I have never seen an extensive wound heal kindlier than did this neck and mastoid wound under the serum. Another application which proved of considerable value during the high temperature and extreme restlessness was a priessnitz pack suggested and applied by my nurse assistant. It served better than drugs to lower the temperature, quiet the child and promote sleep.

1018-1020 Rose Bldg.

"Sooner or later the test of the man comes and is applied not to what he learned at school, but to his very being. He must have the accurate knowledge that the books can give, of course. But he must have more than that. The need is not of less examination, but of still more drastic ordeals to ascertain his points of excellence and his deficiencies. When the crisis comes it will take toll of all that he is and the best that he can do, and in a flash of blinding light the man himself will stand inexorably revealed."—*Anonymous*.

STEVENS' TROPOMETER. ITS VALUE.

J. HOLBROOK SHAW, M. D.,

Plymouth, Mass.

THE following article is offered with a full appreciation of its limitations, imposed in part by the short time allowed for preparation, and asks to be considered only as a part of the common effort to understand and appreciate at its true value an instrument which suggests such alluring possibilities.

We naturally look with favor upon any means which promises to make our work, which is so exacting in its demands, less speculative. Since Dieffenbach first cut an internal rectus muscle and straightened a squinting eye there has been a growing, and as yet unquenched, thirst for an accurate knowledge of the exact capacity of each individual ocular muscle.

This desire for accuracy eventually led to the anomalous use of the perimeter as a means of approximating the pull of a muscle by noting the range of vision in the visual field in the direction of the action of the muscle under examination. In spite of the obvious fallacy of this method due to the interference of the brow, nose, etc., in varying degrees according to the facial peculiarities of the individual, it was evidently quite generally in use when Dr. George T. Stevens, of New York, to whose inventive genius and learning we are so largely indebted for our knowledge of the ocular muscles to-day, devised an instrument which enabled the observer to note with accuracy and record with certainty the excursions of the cornea produced by the various ocular muscles. This instrument, which he called a tropometer, was first exhibited and described at the meeting of the American Medical Association in Baltimore in 1894. Most text-books of ophthalmology contain a cut and description of it. I quote from Fuchs' Text-book of Ophthalmology: "Stevens' tropometer consists essentially of a telescope in which the inverted image of the examined eye is found at the eye-piece when, either as an aerial image or as an image upon the ground glass, its movements can be accurately observed. A graduated scale near the eye-piece is set in a rotating cell which, by means of a

small lever, can be placed horizontally, vertically or obliquely and by means of two graduations, measurements in opposite directions can be made. The head is firmly fixed by a special devise."

The tropometer readings reported here were taken from the office records of Dr. G. A. Suffa, who has generously allowed me to use them, and were made partly by Dr. Suffa and partly by the writer for him. It is interesting to study these readings in the light of Stevens' theory that strabismus is often due to "excessive tension of the vertically acting muscles," when the tension of the laterally acting muscles is quite normal. He says: "It thus appears that even in marked converging squint there may be no important disproportion between the rotating ability of the laterally acting muscles, and that the variation of the excursions from the standard may arise largely, if not wholly, from the influence of the vertically acting forces and the modifications of the cushion of the eye from habitual pressure."

He gives the following as a standard for the normal under the most favorable conditions of adjustment, and adds that the variations from the standard are greatest in the vertical direction.

"Upward 33° to 37° "

"Downward 45° to 50° "

"Inward about 50° "

"Outward about, or rather less than 50° (generally 45°)."

It should be said in explanation of the records offered for comparison with the tropometer readings, that the amount of rotation is secured by requiring the patient to look at the end of a pencil held before him at a little more than the reading distance and carried to one side and the other while the observer watches the behavior of the eye. The point of divergence is secured by holding the pencil in a similar position but carrying it toward the patient and noting when one of the eyes fails to follow it, a procedure which gives reliable information concerning the power of adduction which must be taken into consideration in every operation upon the ocular muscles.

The "card test" is the familiar occlusion or cover test and the record is consequently in prism degrees.

That the personal equation must enter very largely into the results of any test with the tropometer is evident, for one patient will make a much stronger effort to look in the indicated direction than another, and one observer will be able to induce a more satisfactory rotation in the

Patient	Rotation			Diverging Point	Exophoria		Esophoria		Hyperphoria			Tropometer				Remarks
	in	out	L.		dist.	near.	dist.	near.	R. dist.	near.	L. dist.	up	down	in	out	
U. W. 17-144	normal	normal	normal	3"			20*					R 25 L 30	45 40	50 50	40 45	Left internal strabismus. With out correcting lenses.
W. P. 17-204	normal	normal	normal	2"			20*		9*	8*		R 40 L 40	40 40	50 45	40 50	Left internal strabismus. Very variable. Nystagmus later tropometer test gave L 50
C. T. 17-492	normal	-1/8"	normal	(L) 2"			16*				4 1/2*	R 30 L 40	50 40	50 40	50 45	Internal strabismus.
A. M. 18-257	normal	+	normal	3"-5"	8	8			I			R 40 L 40	40 50	50 60	50 55	
M. C. 18-270	-1/8"	normal	-1/8"	0"	3	10						R 45 L 45	55 55	65 60	55 60	
E. H. T. 18-310	-1/8"	-	-1/8"	1"	1	8						R 30 L 25	50 30	45 30	40 40	
B. R. 18-311	+1/8"	-3/8"	normal	(R) 2"-4"								R 25 L 25	40 35	55 30	20 45	Right internal strabismus.
E. B. 18-404	+1/3 cornea	-1/8"	+				60*	65-70*				R 25 L 30	50 55	50 45	35 45	Right internal strabismus.
G. D. R. 18-418	-	-	normal	1"-6"	2	12						R 30 L 30	45 45	50 45	40 50	
L. C. 18-421					1/2	8-12						R 25 L 25	50 50	55 45	45 55	
M. O. 18-509	+3/16"	-1/16"	+1/8"	-1/16"			52*	52*	12*	12*		R 35 L 30	45 50	50 45	30 30+	Left internal strabismus.
V. G. 19-130	+1/8"	normal	+1/8"	0"			70*	70*				R 30 L 30	40 45	60 60	35 40	Left internal strabismus.
W. P. 19-228	+1/16"	normal	+1/32"				45*	55*				R 30 L 30	30 30	50 65	40 40	Left internal strabismus.
H. P. H. 19-260	normal	normal	normal	(L) 4"	2	2	I					R 40 L 40	40 40	50 40	45 40	Uses eyes together at times.
S. A. W. 19-279	normal	-1/8"	-3/16"	(L) 7"	6*	28*						R 20 L 30	40 30	40 30	20 25	Right internal strabismus.
R. S. F. 19-159	+1/8"	-1/8"	-1/8"	4"			55*	60*				R 30 L 40	40 40	50 55	30 35	Alternating internal strabismus.
A. S. 19-222	normal	-1/16"	normal				45*	45*			7*	R 40 L 40	50 50	50 50	50 50-	Operated case of right internal strabismus.
W. D. 19-207	+	normal	+	(R) 3"-4"	8	10						R 40 L 40	40 40	50 40	40 40	Right internal strabismus.
E. K. 20-100	+3/8"	-1/8"	+1/8"				50*	60*				R 30 L 20+	30 30	40 45	25 25	Left external strabismus. Very vision in left eye.
B. V. C. 20-65	-1/8"	normal	-3/16"	+1/16"								R 30 L 30	50 40	35 15	50 75	

patient than another, a source of error noted by Stevens, who, however, puts it aside with the suggestion that "several repetitions will generally result in an effort which is approximately the limit."

It is evident that the use of any instrument which depends for its results almost entirely on the voluntary effort of the patient must be inaccurate and that the best results can only be obtained by a familiarity with it on the part of the examiner only to be acquired by long and careful use.

The writer confesses freely to a skepticism as to the usefulness of the tropometer, which has been greatly modified by this brief study, and recommends a careful perusal of the cases presented here, always in the light of Stevens' own view, and with understanding that in the tropometer readings many inconsistencies are to be found.

In whatever degree the instrument accurately indicates the absolute and relative muscular efficiency, to that extent it supplies information of the greatest value as an indication for the kind and degree of operative procedure in ocular imbalance.

Many interesting problems will suggest themselves to the operator. For instance, how much influence will the tension of the opposing muscle, as shown by the tropometer, have on the success of a "tucking" operation for strabismus? This and kindred problems can only be worked out by the study of a series of operations with tropometer readings.

At present it cannot be trusted too far, and yet it may perhaps be a witness whose testimony we cannot afford to ignore when taken in connection with other evidence. It is somewhat in the same position as the keratometer. No one would correct astigmatism with the evidence of this instrument alone, and yet no one cares to do without it.

With all its shortcomings it is the only instrument we have for measuring with any pretence of precision the pull of the extrinsic ocular muscles and, as such, should receive more attention.

43 Court Street.

BULLET WOUND OF THE MASTOID PROCESS.

JOSEPH V. F. CLAY, M. D.,

Philadelphia, Pa.

BULLET wounds of the mastoid process are not common, and this case is interesting because of the apparent course the bullet took before lodging within the mastoid process.

The patient, a young negress, age twenty-three years, was shot while lying in bed. She was admitted to the Woman's Homœopathic Hospital July 6, 1916, presenting a wound in the left cheek below and anterior to the zygomatic arch. There was some bleeding from the left external auditory canal, and upon examination, a wound was found in the anterior cartilaginous wall, and another wound opposite on the posterior cartilaginous wall. Inspection of the membrana tympani was impossible on account of swelling. There was no evidence that the ball had escaped. X-ray examination was made, stereoscopic and antero-posterior views being taken. These showed clearly the ball lodged in the left mastoid process. Exposure of the mastoid as in performing a simple mastoid exenteration was performed, and after retracting the soft structures, the bullet was clearly visible in the mastoid capsule just below the outer plate. The anterior wall of the process was comminuted. The bullet was dislodged only after undermining the bone around it with a gouge, and it proved to be a thirty-two calibre soft lead ball. The mastoid cells were exenterated and the fractured anterior wall removed. It was interesting to us to note the escape of the lateral sinus, for the ball was resting on the inner plate of the mastoid.

The wound was packed and upper angle sutured. On the third day it was necessary to freely open the wound on account of active suppuration. Three days later the patient developed acute follicular tonsillitis, which subsided in four days. The wound finally healed by slow granulation in six weeks. The middle ear at this time was found to be intact and the wounds in the external canal healed.

We are indebted to Dr. W. F. Barker for X-ray plates of this case.

2102 Chestnut St.



Anterior view of same case.



Lateral view showing bullet lodged within the mastoid process.

LATERAL SINUS THROMBOSIS AND LIGATION OF THE INTERNAL JUGULAR.

REPORT OF A CASE.

ALVA SOWERS, M. D.,

Chicago, Ill.

THROMBOSIS of the lateral sinus is one of the complications of suppurative mastoiditis, the occurrence of which is sufficiently rare to render each case of interest to the otologist.

¹The records of the Manhattan Eye and Ear Infirmary show that of 12,744 cases of suppurative aural discharge treated from 1895 to 1905, 60 were complicated by intra-cranial extension. Of these cases 23 were afflicted by lateral sinus thrombosis, 30 by meningitis, and 7 by brain abscess.

Usually the infection has reached an advanced stage before phlebitis develops, and, therefore, it is seldom seen except in patients who have been neglected or who have been unintelligently treated. A necrosis of the bone lying over the sinus is commonly found and frequently a peri-sinus abscess bathes the sinus wall. Very often sinus thrombosis is not suspected until the operation for mastoiditis is made, when extensive necrosis of bone or epi-dural abscess directs our attention to the condition of the sinus.

²Dench calls attention to the fact that primary aural infection and primary sinus thrombosis may cause brain abscesses upon the opposite side. For this reason much uncertainty exists as to the ultimate outcome of any operative procedure directed toward the primary seat of infection.

ETIOLOGY.

³The causes of infective thrombosis of the sigmoid portion of the lateral sinus are chiefly to be found in the loss of integrity of the intima of the membranous sinus from the extension of the destructive process in suppurative mastoid or labyrinthine inflammation. So long as the intima is healthy it inhibits the coagulation of the blood in contact with it, but where its vitality is impaired by a necrosing mastoiditis its in-

hibitory power is lost and the blood fibrin coagulates on the affected area, and a thrombosis is thus established. The thrombus may or may not occlude the lumen of the vessel. At the beginning it is limited to the external or bony aspect of the sinus, as this is the part first involved by the necrosis of the bone. The necrosis may extend from the mastoid cells of the process or from the labyrinth (in labyrinthine suppuration) to the cells lying between the labyrinth and the antrum, and thence to the antrum and mastoid cells, whence it involves the sinus.

⁴William A. Scruton, of New York City, in the June, 1915, edition of the *Annals of Otology, Rhinology and Laryngology* says: "In a review, which is believed to be complete, of the reported cases of septic thrombosis of the sigmoid sinus, I have failed to notice one in which penetrating wound during mastoidectomy is mentioned as an etiologic factor. Examining ten text-books on otology I found the danger of septic thrombosis following injury of the sinus mentioned in one only, and in that the danger is considered slight.

During my resident hospital service I am certain that I have seen ten or twelve accidental penetrations of the sinus, and having these cases under my observation subsequently know that none of them developed a septic thrombosis. In no instance were special precautions taken to guard against sepsis at the site of the rupture. The hemorrhage was controlled by a plug of iodoform gauze and the entire cavity packed tightly—generally with iodoform gauze—in a few cases with plain gauze."

Scruton, however, cites two cases that were the result of puncture of the sinus with a diagnostic needle.

Puncture with the aspirating needle must be attended with comparatively little danger judging from the frequency of its use and the few unfavorable results.

All authorities hold the streptococcus responsible for the majority of the cases of sinus phlebitis.

The virulence of the infection and the resistance of the patient to the infective organisms are always factors to be considered in the etiology.

PATHOLOGY.

⁵Two conditions lead to sinus thrombosis; a peri-sinus abscess or contact of the sinus wall with diseased bone. The changes in the sinus wall are the same in either case. Just why thrombosis takes place

in one patient and not in another may be explained by the varying resistance toward infection and the condition of the tunica intima of the vein.

Macroscopically, the sinus may be covered with granulations, and on palpation, a doughy feeling may be elicited.

The histo-pathological changes which take place are those of an acute inflammation; *i. e.*, first, dilation of the minute blood vessels and subsequent retardation of the blood current; next transudation of the serum and migration of the leukocytes from the veins into the surrounding tissues. The vessel wall becomes thickened and gradually

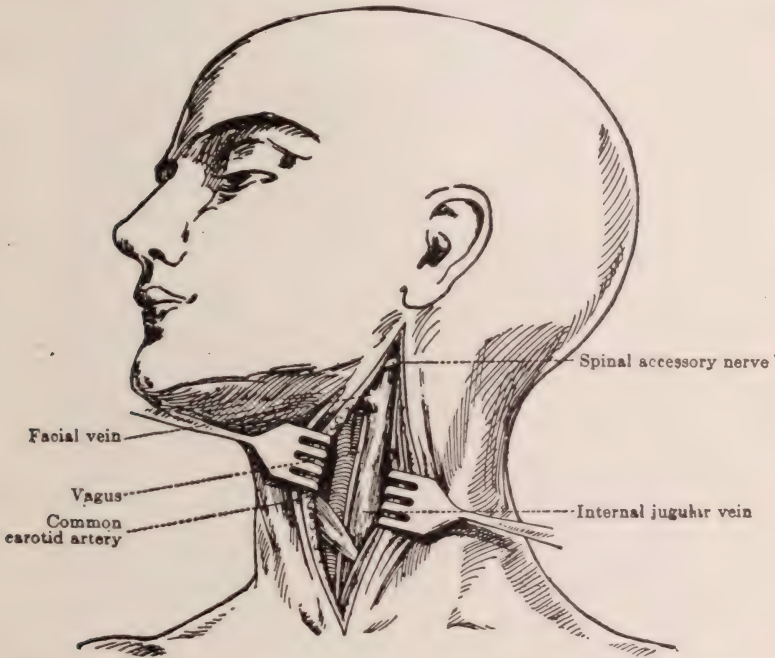


FIG. 1. Showing venous circulation of the skull and the portion of the sigmoid sinus which was obliterated.. (Illustration from Kerrison.)

the lumen becomes smaller and smaller until it may be entirely occluded either by pressure of peri-sinus abscess from without or from blood clot within. At this stage organization may take place in the thrombus. Embryonic connective tissue well supplied with blood vessels replaces the thrombus. The fibrous mass becomes firm, contracts and may completely or partially occlude the vessel. In rare instances the fibrous tissue disappears and leaves the lumen of the vessel unimpaired.

In the septic variety liquefaction takes place and fragments of in-

fect ed emboli are thrown into the general blood stream by way of the internal jugular and are conveyed to various parts of the body, especially the kidneys, lungs and liver where they may produce embolic abscess.

The thrombus may extend from the torcular to the jugular bulb or even down into the jugular.

SYMPTOMATOLOGY.

Frequently sinus thrombosis is not suspected until the mastoid operation has been performed. Periodic chills and fever constitute the most characteristic clinical phenomena of this disease. However, this is not always present.

Mental lethargy is sometimes noted, and again severe headache accompanied by nausea may be complained of.

Optic neuritis is mentioned by some authors as occurring in a certain percentage of cases.

Bacteria may be found on blood cultures. The most frequent infection is due to the streptococcus according to Libman, Leutert and Sueffle.

Under physical signs may be mentioned tenderness over the emissary vein, and in cases where the phlebitis extends down into the jugular vein, tenderness may be elicited along the anterior border of the sterno-cleido-mastoid muscle.

The sinus wall on being exposed at the time of operation may present inflammatory adhesions to the overlying bone.

A peri-sinus abscess should always lead us to regard the sinus with suspicion.

The same may be said when granulations are found on the dural wall of the sinus.

If a clot has formed within the wall a doughy feeling may be noted on palpation.

The wall may show a purplish hue rather than the typical blue-gray of the dura.

On aspiration no blood will be withdrawn.

The aspirating needle will meet with resistance after passing through the outer wall.

In cases of septic thrombosis metastatic abscesses will sooner or

LATERAL SINUS THROMBOSIS.

later appear in the lungs, kidneys or liver, and the patient will show evidence of general emaciation and loss of vitality.

PROGNOSIS.

Ballenger says, "Here is a field in which an early diagnosis and an early operation are the means of saving life; whereas a later diagnosis, even with operative interference, will in the majority of subjects result in death.



FIG. 2. Profile of the author's case showing the line of incision for ligation of the jugular.

⁷According to Dench a very small proportion of sinus thromboses may recover spontaneously. In many cases, where spontaneous recovery has apparently taken place, these patients undoubtedly die later from some secondary deposit in the brain or in some other location. Out of 43 cases in which he operated there were 36 recoveries.

INDICATIONS FOR OPENING THE SINUS.

⁸Where suspicion is aroused by the post-operative persistence of

temperature, the advent of the headache, etc., whether the operation in question was the simple or the radical mastoid, and where the symptom complex is otherwise unexplainable—a test puncture failing to furnish additional diagnostic data—then the incision of the sinus is indicated to establish the diagnosis of thrombus. Where the findings are positive we clean out the infected accumulations from the vessel.

Where, during the performance of mastoidectomy, the destruction of bone has extended to the inner table and has exposed the sinus wall, bathing it in the purulent contents of the mastoid cavity, or involving the sinus in a peri-sinus abscess, and where the evisceration of the diseased bone and the cleaning of the wound cavity is not followed by prompt cessation of pyemic symptoms, then the opening of the suspected vessel is indicated.

Furthermore, in cases where a peri-sinus abscess is uncovered and is found to involve the integrity of the vessel wall, or to have destroyed the wall and where the sinus itself is open and contains pus, shut off above and below by obstructing thrombi, then the cleaning of the open sinus is indicated with ligature or resection of the internal jugular, as the condition presented may demand.

When a sinus is either uncovered, or is found upon exposure to be hard, non-pulsating, almost incompressible and discolored—then the opening of the implicated vessel is indicated, if septic symptoms persist for any length of time (usually 24 hours) after the performance of mastoidectomy. In all these cases, except possibly, where we find the vessel opened by the purulent process, we first perform the mastoid operation, and then await the clinical development of the case.

We do not advocate immediately opening the sinus upon mere suspicion, but only when we have clinical symptoms of sepsis pointing to the sinus, which persist after mastoidectomy has been performed.

As Korner, Heine and others point out, many cases exhibiting distinct pyemic symptoms recover without operation upon the sinus, even when peri-sinus abscesses are present, an observation which has been verified in cases under our care.

The above indications seem to me most clearly outlined, and I quote them verbatim from Kopetsky's work, entitled "Surgery of the Ear."

HISTORY: Mr. P. A. July 25, 1916. Age, 25 years. Nationality,

LATERAL SINUS THROMBOSIS.

Russian Jew. Occupation, barber. Married and has two healthy children.

PREVIOUS HEALTH: Six years ago the drum of the right ear was intentionally mutilated by instillation of some "drops" for the purpose of producing a discharge that the patient might be excused from service in the Russian army. The discharge completely subsided and remained so after he came to America. His health otherwise has been good.

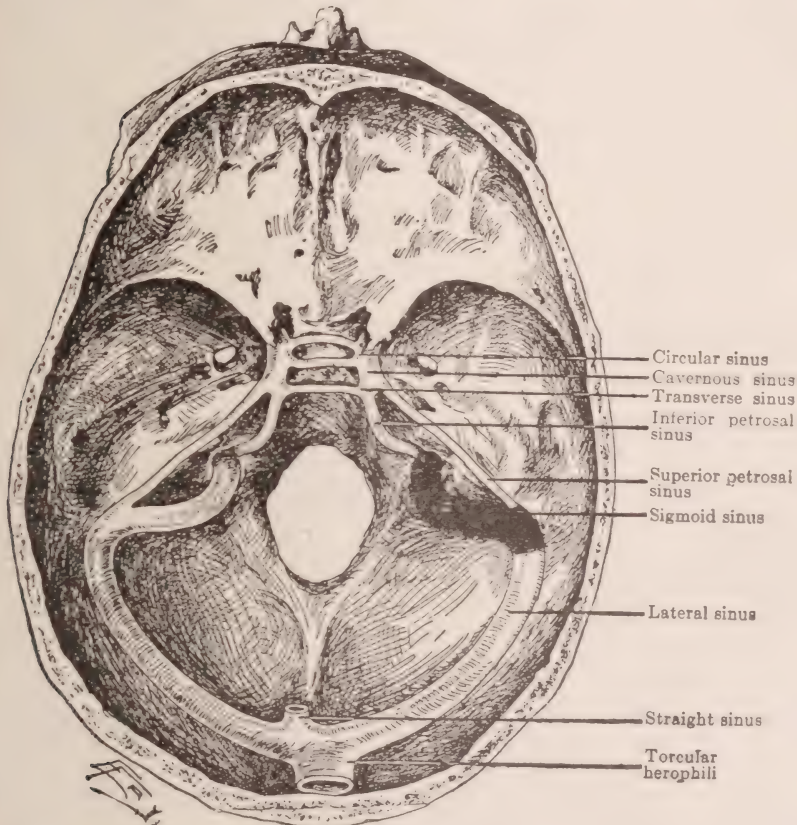


FIG. 3. Diagram of the important surgical structures of the neck. (Illustration from Kerrison.)

PRESENT COMPLAINT: Three months ago following an acute rhinitis the right ear again began to discharge. He complained of pain and headache. Being more or less irresponsible he wandered from one physician to another. The pain subsided but the discharge continued. Eight days ago he was forced to abandon his work because of headache and pain in his right ear.

ALVA SOWERS.

PRE-OPERATIVE FINDINGS: Profuse yellow discharge in the external auditory canal. Tenderness over the mastoid antrum and especially over the tip. Firm pressure elicited excruciating pain. Temperature, 98.8; pulse, 96; respiration, 24; tongue thickly coated.

BLOOD: Differential count number per C. MM., 20,150; lymphocytes, 10 per cent.; large mononuclears, 4 per cent.; neutrophiles, 1 per cent. 7-25-16 (Kosanke).

URINE: Single sample: Specific gravity, 1021; total solids, 48.93 per liter; urea, 345 gm. per liter; indican, much increased; proteins, negative; carbohydrates, negative; Diazo tests, negative. 7-24-16. (Kosanke and Winnard).

DIAGNOSIS: Acute exacerbation of a chronic mastoiditis. Patient was prepared for operation the following morning.

ANESTHETIC RECORD.

DATE: July 25, 1916.

NAME: Mr. P. A. Ward 210.

SURGEON: Doctor Sowers.

ASSISTANT: Doctor Ricker.

ANESTHETIST: Doctor Howe.

INSTRUMENT NURSE: Miss Middleworth.

ANESTHETIC AGENT: Ether. Began 9:20 A. M., ended 10:40 A. M.

OPERATION: Simple mastoid. Began 9:30 A. M., ended 10:50 A. M.

OPERATIVE FINDINGS: Cortex intact, antrum filled with pus, extensive necrosis of the tip cells, peri-sinus abscess, sinus blue in appearance, and on palpation presented a doughy feel. On aspiration of the sinus only a clear serum could be withdrawn. The resistance encountered when inserting the needle gave conclusive evidence of an organized blood clot within the sinus.

DRESSING: Mastoid wound was packed with iodoform gauze and covered with a large gauze pad.

RECORDER: Miss Dittmer.

It is not unusual to discover an unsuspected thrombosis at the time of operation on the mastoid. This patient gave no history to suggest such a condition and he had not been in our care long enough for the temperature chart to be of value. While these patients may some-

LATERAL SINUS THROMBOSIS.

times recover without opening the sinus and ligating the internal jugular, it is better surgery to take this precaution.

The condition of the patient was such that it seemed wise to postpone further operative work until the following morning. In the ligation of the internal jugular I was assisted by Dr. R. A. Melendy, to whom I am indebted for many valuable suggestions in the post-operative care. The patient recovered promptly from the mastoid operation and was prepared for the secondary operation the following morning.

LIGATION OF THE JUGULAR.

Anesthetic Record.

DATE: July 26, 1916.

NAME: Mr. P. A. Ward 210.

SURGEON: Dr. Sowers.

ASSISTANTS: Doctors Melendy and Ricker.

INSTRUMENT NURSE: Miss Ascevedo.

ANESTHETIST: Dr. T. E. Costain.

ANESTHETIC AGENT: Gas-oxygen. Began 9:20 A. M., ended 11:07 A. M.

OPERATION: Ligation of jugular and opening of the sinus. Began 9:24 A. M., ended 11:30 A. M.

TECHNIQUE: An incision dividing the skin, superficial fascia and platysma myoides muscle was made extending from one mastoid tip to a point just above the sterno-clavicular articulation. The anterior border of the sterno-mastoid muscle was now exposed. The external jugular presented itself in the field but was easily retracted and did not require ligation. With the blunt end of the scalpel the sterno-mastoid muscle was freed and pushed backward. The deep fascia was divided by blunt dissection, and the common sheath of the internal jugular, carotid artery and pneumogastric nerve was brought into view. The vein was filled with blood and was readily recognized. The sheath was opened and the vein carefully separated from the artery and nerve to a point just above the facial branch which appears at the level of the hyoid bone.

Ligation with cat-gut at this point seemed sufficient, as there was no evidence of thrombosis below the jugular bulb. The muscle was replaced and the wound closed by sutures of silk-worm gut. The wound was dressed daily.

OPERATIVE FINDINGS: Thrombus organized and extending from the knee to the bulb. Free flow of blood did not occur, although the external wall of the sinus was removed and a curette passed from knee to bulb. The jugular was filled with blood and showed no evidence of phlebitis below the bulb. Ligature was applied above the facial vein.

DRESSING: The mastoid wound was partially sutured and packed with iodoform over which plain gauze was applied. The neck wound was sutured without drainage and dressed dry.

RECORDER: Miss Dittmer.

July 27th: Temperature ranged from 100.6° at noon to 103.6° at 6:00 P. M., with a respiration of 36 per min. Rx. Strychnia Sulp. gr. 1/30 by hypo every 4 hrs. Rx. Urotropin gr. x every 4 hrs. Rx. Echinacea Tr. 10 drops q. i. d. Rx. Spts. Fermenti 2 ounces every 3 hrs. Complaints of difficulty in swallowing and breathing. Urine shows albumen present.

July 28th: Temp. showed an afternoon rise reaching 102° at 8:00 P. M. Rx. Mag. Sulph. 2 drams each morning.

July 29th: Temp. 103° at 4:00 P. M. Lower wound shows infection. Patient looks septic. Up on a back rest. Rx. Calomel gr. 1/4 every half hour for six doses. Rx. Sodium acetate gr. x every 4 hrs.

July 31st: Blood culture negative (Hastings). Temp., 100°; pulse, 98; resp., 26 at 3:30 P. M.

Aug. 4th: Complaints of cystitis. Urotropin discontinued. Rx. Stigmata Maydis 10 drops t. i. d.

Aug. 5th: Urine shows some albumen but no casts (Kosanke).

Aug. 6th: Up in a chair. Temp. varies about one degree in twenty-four hours. Appetite good.

Aug. 8th: Rx. Tr. China, one drop t. i. d.

Aug. 12th: Blood—dif. count, lymphocytes, 27 per cent.; large mononuclears, 5 per cent.; neutrophiles, 66 per cent.; myelocytes, 2 per cent.

Aug. 17th: 24th day. Discharged from the hospital with instruction to return to office for dressings.

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122 S. Michigan Ave.

Wishes come and Wishes go,
Every Christmas time 'tis so;
None more tender, none more true.
Than this wish of mine to you,
Sent in all regard to say:
Joyous be your Christmas Day.

JOHN L. MOFFAT.

AN EFFICIENT EYE BANDAGE.

A. E. IBERSHOFF, M. D.,

Cleveland, Ohio.

AN efficient eye bandage is one which is comfortable yet secure, easily applied and as readily removed, simple and inexpensive. The common eye pad held in place by means of adhesive strips is applicable to the vast majority of patients in whom cosmetic



considerations are secondary. Yet it is none too secure and its removal is often painful, while the surrounding area becomes soiled and gummy. In hospital cases the bandage dressing will be the one of preference

AN EFFICIENT EYE BANDAGE.

following operation or in acute cases the treatment of which does not necessitate the frequent removal of the dressing. There are two classes of cases, however, in which the ordinary eye dressing leaves much to be desired, viz.: First, the better class of ambulant or office patients who demand a neat and inconspicuous minimal dressing, and second, the ambulant clinic cases in whom absolute firmness is the prime requisite. It is for the last two classes of patients that the eye dressing to be described is especially adapted.

Briefly, this dressing consists of one yard of three-inch gauze bandage split from each end to within one inch of center. This leaves an uncut section two by three inches in the middle of the bandage. A single knot is tied in the strands just at their attachment to the center pad. This maneuver converts the pad into a shallow pocket which may be filled with cut gauze or cotton to the desired thickness. To apply the bandage carry the two strands on the same side as the eye to be dressed around the head to the occiput, and tie with the *lower* strand of the opposite side. Then carry the *upper* strand backward along the sagittal suture and tie with the others in a common knot. If desired, the hair can be combed over this sagittal strand, completely concealing the same from view.

The bandage properly applied will be found remarkably secure yet perfectly comfortable. It is easily prepared from a strip of any ordinary cloth and will fit either eye.

822-24 Rose Building.

PERSONAL EXPERIENCES IN EYE TROUBLES.

JAMES A. CAMPBELL, M. D.,

St. Louis, Mo.

TWO or three weeks ago the editor of the JOURNAL for December asked me for a contribution, not a high and startling scientific pyrotechnic, but a rambling, discursive, practical talk on some "Personal Experiences in Eye Troubles," certainly a wide latitude. It would extend back and embrace over forty years' active college, clinical and hospital work, rich in surprises and disappointments as well as successes.

Right here I am free to acknowledge that the first great progressive step made, after I got away from my text-books and lecture rostrums, both here and in other lands, was the bewildering but valuable discovery that there were so many things I knew that were not so; that there were no hard and fast rules covering every case. In short, I became less "cock-sure," but more careful and certain in my diagnosis and treatment, and hence successful. There is really, in this country, too much scientific sneezing when some man in Berlin or Vienna takes snuff.

With these few side remarks, I beg leave to offer a brief contribution on

CATARACT TENDENCY WITH RETARDED DEVELOPMENT.

When a patient comes to us complaining of a gradual diminution of vision, and a careful examination shows it not to be a refraction trouble, disease of the fundus, optic nerve, vitreous, or inflammatory disease whatever, but a cloudiness of the lens, we pronounce it beginning cataract, which, following the usual rule, will gradually grow worse and worse until the patient will be blind. The condition is explained to the patient and its probable progression toward eventual blindness will be recorded.

Without discussing the prime causes of cataract, or examining the many theories offered, we may accept it as a condition of the lens, with loss of transparency associated with and following diminished

PERSONAL EXPERIENCES IN EYE TROUBLES.

vitality of the lens, which is, as a rule, progressive until sooner or later blindness follows.

At the Kansas City meeting of the O., O. and L. Association, a few years ago, I discussed congenital defects of the lens, which remained throughout lifetime, simulating cataract and often misleading as to prognosis. I desire to present here another lens condition, clearly cataractous in tendency, but which does not follow along the usual lines of development. I will illustrate by giving a few conspicuous cases.

CASE NO. 1.—Mr. M. H., age 44, came to me in 1881. V. = 15/32, with + 2.5 15/15; with + 3.50 s. J 1 at 15 inches. Tn. No fundus trouble. From time to time eyes bothered. In 1889 lenses showed a little diffuse cloudiness. In 1900, V. R. = 15/50, with — .75s 15/20. L. 15/40 with 1-s 15/20. J 1. with + 1. s. In a few months his vision was 15/20 without glasses, better with — 1. s. He then moved to Chicago. I gave him a letter to Dr. H. Gurnee Fellows, with history of the case. Dr. Fellows watched over the eyes, which gradually lost sight, and in 1914 one eye successfully operated on for cataract; the other eye still retained vision enough to see to get around. Thus this case went twenty-five years before the slowly progressive cataract was developed. The gradual change from hyperopia requiring a + 2. s glass in the beginning to a — 1. s will be noticed. This is because of a swelling of the lens stroma, generally significant of developing cataract, and is undoubtedly the explanation of what is known as "second sight" in old people.

CASE NO. 2.—In 1881 I operated on the left eye of a man about 60, for cataract. The other eye was quite cloudy at the time. I told him that I thought that the right eye would probably be blind within a year's time. I watched this case ten years and the right eye remained about the same.

CASE NO. 3.—Mrs. G. C., 48 years old, came to me in 1887, with V. R. = 15/30; with + 1. s = 15/20. Oblique illumination and ophthalmoscope showed no fundus changes, but a little cloudiness of the lens. In 1890 more cloudy. In 1892 V. R. = 15/30; L. 15/70 with — .87 s 15/20. In 1894, V. R. = 15/70. with — 2. s c —75 c ax. 45 15/30. L. = 15/100 with — 2. s 15/70. There was a slow progress until 1909, V. R. = 15/50; L. = 15/70. This improvement fol-

lowed the use of the Wappler massage. In 1916, R. 15/70. L. = O cataract. Thus this case went from 1887 to 1916, twenty-nine years before complete development of cataract in the left eye. The right eye still has sight enough to enable her to get about without aid, and since she is 77 years old and perfectly well otherwise, she refuses any operation on the eye.

CASE No. 4.—Mrs. H. M., age 50, came to me in 1880. Always myopic. Wore at that time — 4. s, both eyes giving 15/30 vision. There was a choroidal atrophic ring all around the disc in both eyes with some choroidal mottling. The lenses in both eyes were not quite clear, not a cortical striation, but a diffuse cloudy effect. From time to time, as the years went by, examination of the eyes showed a slowly progressive increase in the lens' lack of transparency. She died four years ago, thirty-four years after I first examined her eyes, with lens more cloudy, but still with sufficient vision left to get about quite well.

CASE No. 5.—Miss S. B. came to me thirty years ago, stating that there was a growing impairment of her sight. Another oculist, of excellent standing, had examined her eyes, and had told her that she had the beginning of cataract in both eyes, and that in all probability she would be blind in a few years. She was wearing — 4. s glass in both eyes, which gave her V. = 15/30. Here, too, was a large myopic aching all around the discs. The lenses were not clear, a diffuse cloudiness. I explained the situation to her but reserved my prognosis until future developments took place. There was a slight increase of lens involvement, not from month to month, but from year to year. She successfully completed her fifty years as a teacher in the high school. Her sight has slowly diminished, but she still has enough left to go and come whenever and wherever she wishes.

CASE No. 6.—Miss D., age 45, came to me five years ago, with the statement that she had always been near-sighted, but within the last few months her vision had become much worse than formerly. She thought she needed new glasses. Her vision was R. = 15/240; with — 5. s \subset — 1. c ax. 180 = 15/50. L. = 5/300, with — 10. s 15/70; neither eye was improved by any other glasses. Ophthalmoscope showed central nuclear lens cloudiness, shading off less so toward the periphery. The choroid was somewhat mottled in both

eyes. As her sight had been growing gradually worse for a year or so, and since no other glass combination seemed indicated, I was of the opinion that the changing lens condition would fully account for the diminishing sight, and if this progressed as it had been doing, a fully developed cataract would result in a comparatively short time. This I explained to the patient and suggested the trial of the eye massage treatment, which she readily consented to. This was kept up for some months when the vision of the right eye, with the same glasses, instead of 15/100 became 15/40; and the left eye 15/40 instead of 15/70. At the present time, five years after I first saw her, her sight is 15/40. I present this case to demonstrate how seven years after progressive diminution of sight had been first noticed by the patient, she sees better than she did five years ago.

I am sure that to many who have been in the work long enough to observe the slow progress of similar cases over long intervals, there is nothing especially new in the above observations, but I am equally certain that until such opportunities have come to you, you have often been mystified and misled into giving premature opinions and wrong prognoses. It is for these reasons I comment on this particular class of cases, stating that the longer I have been in the work the more guarded is my prognosis. I have, indeed, reached the position where I promise very little and guarantee nothing, except to give each case my most careful and diligent attention.

Mermod-Jaccard Bldg.

Fistula Lachrymalis.—A cure may sometimes be obtained with the aid of Petrol, and Sil. in alternation every fourth day. Petroleum acts very slowly.

AN OPEN LETTER FROM THE EXEC. COMM. OF THE AMER. INST. OF HOM.

IN accordance with the revised Constitution and By-Laws of the American Institute of Homœopathy and the new plan of reorganization and operation adopted by the American Institute at Baltimore, the Executive Committee consisting of J. P. Cobb, F. M. Dearborn and C. E. Sawyer, to whom the matter of installation of the new plan was assigned, have secured a suite of 6 rooms in the Marshall Field Bldg, Chicago, in which have been opened the administrative offices of the American Institute of Homœopathy.

The section of Publication, directed by Sarah M. Hobson; the accounting and recording section by the newly employed Secretary-Treasurer, T. E. Costain. The Supervision Section, under the direction of the Executive Committee, all find commodious quarters in which to pursue their work.

With a corps of capable assistants for each division in offices with equipment with which to work efficiently and promptly, the business affairs of the American Institute of Homœopathy are now really ready to proceed.

With a definite systematized plan for the conduct and consideration of all matters pertaining to all homœopathic interests; with the centralizing of all forces; with a definite fixed purpose; with paid assistants to carry on the work, all that is now required to promote Homœopathy is the hearty co-operation of the profession.

Homœopathy has been at a great disadvantage because it has had no central office in which to operate, no place from which to direct, no specific management, no fixed plan of operation. All of this is now changed, and the work of the American Institute of Homœopathy will be pushed with energy and enthusiasm.

Among the matters to which especial and immediate attention will be given by the administrative department is a complete and reliable list of all homœopathic practitioners throughout the United States. We wish to know just who the active homœopaths of the country are and where they are located. We believe that it is better to have a few

AN OPEN LETTER.

thousand of real workers who are ready and willing to assist than thousands of nominal members indifferent to homœopathic interests.

So it shall be our aim to enlist in the reorganization only those that are ready and in earnest in promoting things homœopathic.

No body of professional men ever had more which is worthy of presentment than the homœopathic profession, none with better prospect of accomplishment. As proof of these assertions let us take an inventory of what we have found, then we will be the better able to conclude whether the required effort is justifiable.

From the recent report of the Council on Medical Education we find there are in the United States 101 accredited homœopathic hospitals, representing 20,092 beds.

During the past fiscal year there were treated in these hospitals 109,527 hospital patients, with an average mortality rate of 4.1 per cent.

It requires annually 248 internes to properly house-staff these hospitals.

The property value of these strictly homœopathic institutions is \$36,819,452. In the out-door, or dispensary departments of these institutions, there were treated during the last fiscal year 287,887 patients.

In the training schools for nurses connected with the purely homœopathic institutions there were enrolled last year 1,849 pupils. In addition to this we have:

- 10 national medical societies.
- 31 State medical societies.
- 75 local medical societies.
- 34 medical clubs.
- 6 homœopathic alumni associations.
- 29 homœopathic dispensaries.
- 10 homœopathic colleges.
- 18 homœopathic journals.

And with ten thousand active practitioners throughout the country serving an intellectual people, 35 per cent. of whom employ homœopaths, it is only reasonable to assume that a business organization is necessary, and only reasonable to presume that a well organized and conducted business administration will elevate medical standards, increase patronage, develop interest and force recognition.

That is all possible by a combined effort which will be brought about by federation and affiliation of all medical societies, colleges, hospitals, training schools, clubs, fraternities and individuals. In union there is strength, and it is the determination of those in charge to bring about a hearty co-operation of the profession. This is only one of many things all ready on the way to establish Homœopathy in the front rank of medical fraternities

ABSTRACTS.

The Importance of the Examination of the Larynx in General Practice.—N. Schoolman (*Jour. of O. and O.-L.*, June, 1916) calls attention to the large class of patients under observation by the general practitioner who have definite laryngeal lesions which remain for a long time undiscovered, very often undiscovered until it is too late to do anything for the patient. A simple examination of the larynx would have brought them to light, but the examination is not made. The reason for the very frequent and deplorable failure to examine the larynx lies deeply rooted in the mental attitude of the physician who refuses to suspect trouble in the larynx, unless such trouble is absolutely apparent.

It is not expected that in the early stages of many diseases, when there is not enough evidence for even a tentative diagnosis, when the physician is disposed to treat the case expectantly and await developments, that he should turn to the larynx in the hope of finding there, of all places, the master key to the situation. How very frequently does it happen that the making of a diagnosis is deferred for an indefinite period for the reason that the case failed to impress the physician seriously. There was nothing in particular to arrest attention; no danger signal is discovered; there does not seem to be any particular cause for alarm. An occasional cough, a mild hoarseness, a feebleness of the voice perhaps, chest examination negative or inconclusive, general condition fair; the physician does not feel justified in alarming his patient. It is most likely nothing serious. A prescription is given, the patient is reassured, feels better for a time, then comes back often to another physician who in his turn fails to be impressed and decides to await developments. And so weeks or months pass away; valuable time lost.

It is well to point out and emphasize the important fact that serious lesions may exist in the larynx for a long time with clinical manifestation, so mild, that unless one is on the alert, or one examines the larynx as a routine, he may easily overlook them, with incalculable loss to the patient's chances for cure. And, also, that the larynx may

ABSTRACTS.

become involved secondarily quite early in the period of expectancy and temporizing, so early that if but discovered it would constitute the only definite finding on which to base diagnosis and treatment.

Two cases, treated for *asthma* for a long time, were cured by removing laryngeal papillomata, and a third (with chronic valvular trouble) much ameliorated.

It is commonly taken for granted that no larynx will quietly submit to the continued presence of a foreign body, that is why it does not ordinarily occur to one to look for a foreign body in a more or less quiescent larynx. As a result of this mental attitude, it has come to pass that foreign bodies, such as jack stones, open safety pins, arrow heads, tacks, rings, coins, etc., have been allowed to remain undisturbed in the throats and bronchi of children for weeks and months. Incredible as it may seem, it appears that the larynx as well as the bronchi meekly proceed to accommodate themselves as best they may to the presence of offending substances after the first attempts to dislodge them fail. The subsequent hoarseness, cough, dyspnea, cyanosis, etc., are not unlike similar symptoms in ordinary affections of the air passages. These cases are, therefore, treated for various forms of bronchitis, laryngitis, pneumonia, tuberculosis, lung abscess, etc., until the foreign body is discovered by laryngoscopy, bronchoscopy, or X-ray.

The neglect of the early diagnosis of benign tumors of the larynx, while not a serious omission, subjects the patient to futile treatment, and there is always the danger, especially in older patients, of a benign tumor becoming malignant. Dr. Freer has known a patient to be sprayed for six months for supposed laryngeal catarrh by means of an atomizer and tongue depressor, while an unseen carcinoma rapidly advanced to a hopeless stage; and in another case the laryngoscope was not used until the carcinoma had penetrated the laryngeal cartilages and presented itself as a tumor in the neck. Chronic hoarseness, especially in men past forty, should make a laryngoscopic examination an imperative duty to all practitioners. The symptom of pain appears in the later stages of carcinoma, characterized by sloughing and ulceration; it takes the form of otalgia occurring during swallowing or spontaneously and darts from the larynx to the ear, the angle of the jaw and the back of the head.

Tubercular laryngitis occurs early in the course of pulmonary tuberculosis, and is the cause of the irritative cough when chest conditions are as yet indeterminate. Moreover, this laryngitis does not manifest itself by painful or alarming symptoms; it is only in the later stages, when the deeper structures of the larynx become involved with perichondritis and ulceration of cartilages, that the condition becomes painful. Laryngeal involvement is not necessarily a self-evident condition. It may be overlooked. But when one is on the lookout for it, it may be discovered quite early in the progress of the causal affection and greatly aid in an early diagnosis.

Vocal cord fixation when not due to paralysis of the recurrent laryngeal, may be caused by tubercular, gummatous, or malignant infiltration of its musculature or the crico-arytenoid articulation. It is rarely due to rheumatic arthritis of that joint. This fixation may occur quite early in the disease, its discovery would compel immediate investigation of the cause. Yet the condition is frequently overlooked for a long time because neither the objective nor the subjective symptoms of vocal cord fixation are at all pronounced. The same is true of nerve paralysis.

Long before the typical symptoms of aneurysm, for instance, become clinically manifest, the distending aorta may exert sufficient pressure to paralyze the left recurrent laryngeal nerve, yet neither the subjective nor the objective signs of this paralysis are necessarily marked; they may be so mild as to be disregarded by the patient and overlooked by the physician.

It may be asked how is it possible for a laryngeal paralysis to be passed unnoticed. This will become evident on a brief consideration of the anatomy and function of the larynx.

The larynx has a double function—respiration and voice production; these are antagonistic, and an impediment in the one tends to favor the other function. The muscles that abduct the cords may be said to be the respiratory group, while those that adduct the cords may be considered the phonatory group. The inferior or recurrent laryngeal is the motor nerve for both the respiratory and phonatory groups of muscles. Let us suppose that the left recurrent laryngeal nerve, the one most frequently involved, is pressed upon by an aortic aneurysm completely paralyzing it. Both abductors and adductors are

inactive, the left cord will remain midway between adduction and abduction, "the cadaveric position." Quiet breathing is not interfered with in such a case, it is only an effort at deep inspiration, as in running or other out of the ordinary exertions, that embarrassment will ensue.

How will this complete paralysis of the left recurrent laryngeal affect the function of voice production? It is true that the left cord is unable to meet its fellow in the median line. But in such instances the right vocal cord has been known to cross the middle line towards its helpless brother, approach it in loving tenderness and vocalize in unison. This vocal product may, of course, not be perfect, it may not ring quite true. Its timbre may be cracked, it may possess a quality which the French authors term "bitonal," and if one is not alert to note this voice modification, slight in some cases, there will be little else to arouse his suspicion.

Suppose the recurrent laryngeal is only partially paralyzed, in such cases, according to Semon's law, the abductors are affected while the adductors escape. The active adductors fix the cord in the median line, a position favorable for phonation, while the healthy cord, receding widely from the median line, can provide sufficient spaces for the ordinary demands of breathing.

Henri Aboulker reports twenty-two cases of laryngeal paralysis of various causes. He finds that in all these the paralysis occurred early in the course of the underlying condition. He further finds that this paralysis in most cases betrayed itself only by "bitonality" of the voice. He quotes Lermoyez: "The larynx is the manometer of the thorax, it is the gauge of intrathoracic pressure." By a study of the larynx one may detect abnormal tension in the lungs. The reason for this will be appreciated when it is recalled that the recurrent laryngeal nerve in its long course down under the arch of the aorta on the left, under the subclavian artery on the right and up again in the tracheo-esophageal recess to the larynx, must of necessity be involved in the various pathological processes of these regions. The longer course of the left recurrent laryngeal into the thorax and its relation to the arch of the aorta may explain the greater frequency of involvement of the left laryngeal over the right, which in Aboulker's series was seven to one.

ABSTRACTS.

Of Aboulker's twenty-two cases, the cause of the paralysis could not be determined in four. Of the remaining eighteen cases the causes were: tracheo-bronchial glandular enlargements, three; pulmonary tuberculosis, seven; aortic aneurysm, two; carcinoma of the lungs, one; hydatid cyst of the lung, one; cancer of the esophagus and thyroid gland, one; hysteria, one; cerebral syphilis, one; amyotrophic lateral sclerosis, one; hysteria, one. The characteristic of hysteria paralysis is that, contrary to Semon's law, the paralysis affects the adductors, while the abductors keep the cords widely open, rendering the patient voiceless.

A shifting of the clinical picture from the phonatory function of the larynx to the respiratory function may be suggestive of aneurysm for the following reasons: the pressure exerted by solid tumors, especially of the malignant type, is a steadily progressive one. The pressure exerted by an aneurysm is, on the contrary, a fluctuating one. Under rest and other suitable treatment the aneurysm may diminish in size. Again, the formation of a mural thrombus may greatly diminish the lumen, the blood stream, the distention and pressure.—J. L. M.

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and Laryngology

Devoted to the Interests of Exclusivists, Specialists
and General Practitioners

EDITOR:

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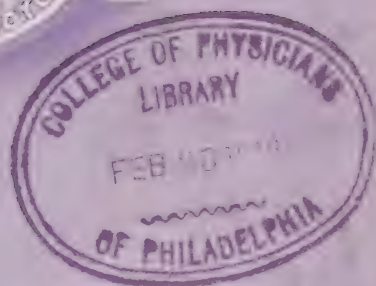
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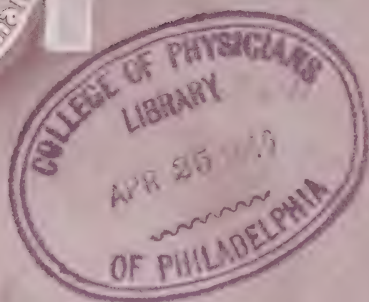
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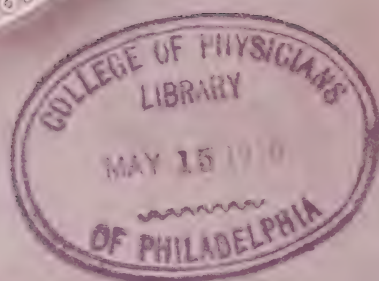
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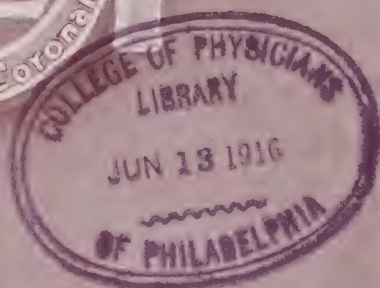
Room with bath for two, \$3.50, \$4.00, \$4.50, \$5.00, \$6.00 and \$7.00

Suites of two rooms, 2 persons, \$5.00, \$7.00, \$8.00 and \$10.00.

Suites of two rooms, 4 persons, \$7.00, \$9.00, \$10.00 and \$12.00

Parlor, two bedrooms, two baths, \$12.00 and \$15.00

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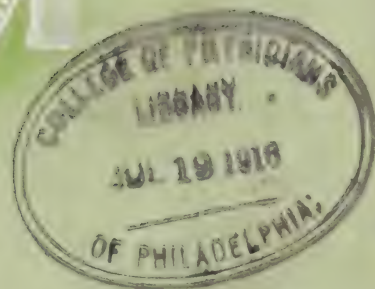
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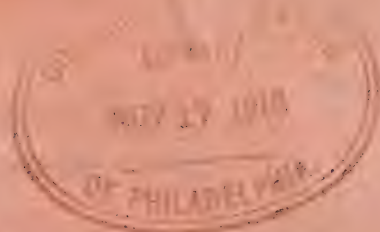
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